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REPORT

OF THE

DELEGATES OF THE UNITED STATES

TO THE

PAN-AMERICAN SCIENTIFIC CONGRESS

HELD AT

SANTIAGO, CHILE

DECEMBER 25, 1908, TO JANUARY 5, 1909

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WASHINGTON
GOVERNMENT PRINTING OFFICE
1909

To the Senate and House of Representatives:

I transmit herewith for the information of Congress the report of the delegates of the United States sent to the Pan-American Scientific Congress held at Santiago, Chile, in pursuance of the sundry civil act approved May 27, 1908, "to enable the Government of the United States to be fittingly represented at the First Pan-American Scientific Congress, to be held at Santiago, Chile, during the year 1908."

WM. H. TAFT.

THE WHITE HOUSE, *May 28, 1909.*

The PRESIDENT:

The undersigned, Acting Secretary of State, has the honor to lay before the President, with a view to its transmission to the Congress, the report of the delegates of the United States sent to the Pan-American Scientific Congress held at Santiago, Chile, in pursuance of the provision of the sundry civil act approved May 27, 1908, "to enable the Government of the United States to be fittingly represented at the First Pan-American Scientific Congress, to be held at Santiago, Chile, during the year 1908."

Respectfully submitted.

HUNTINGTON WILSON,
Acting Secretary of State.

DEPARTMENT OF STATE,
Washington, May 25, 1909.

REPORT OF THE DELEGATES OF THE UNITED STATES TO THE PAN-AMERICAN SCIENTIFIC CONGRESS.

SIR: The undersigned delegates of the Pan-American Scientific Congress, held at Santiago, Chile, December 25, 1908, to January 5, 1909, have the honor to submit the following report and to attach thereto:

A. Pan-American Scientific Congress: Message of President of United States and memorandum of Secretary of State.
B. List of papers presented to the Pan-American Scientific Congress.
C. Abstract of address of the chairman of the delegation of the United States at the inaugural session.
D. Abstract of address of the chairman of the delegation of the United States at the closing session.
E. Report on section 1: Pure and applied mathematics.
F. Report on section 2: Physical and chemical sciences.
G. Report on section 3, subsection 1: Anthropology and ethnology of the American races.
H. Report on section 3, subsections 2 and 3: Zoology and botany.
I. Report on section 3, subsection 4: Geology and related subjects.
J. Report on section 4: Engineering.
K. Report on section 5: Medical science and hygiene.
L. Report on section 6: Juridical sciences.
M. Report on section 7, subsections:
    (*a*) History.
    (*b*) International law.
    (*c*) Representative and parliamentary government.
    (*d*) Diplomatic history and international policy.
N. Report on section 8: Sciences of pedagogy and philosophy. Subsection 17: Fine arts.
O. Report on section 9: Agronomy and zootechnics.
P. Names of members of the official delegation of the United States, delegates of Association of American Universities, delegates of American universities, and delegates of other institutions.
Q. Personnel of organization committee and regulations of the Pan-American Scientific Congress.
R. Local committees of the Pan-American Scientific Congress.

ANTECEDENTS OF THE FIRST PAN-AMERICAN SCIENTIFIC CONGRESS.

The first impulse to the holding of these scientific congresses was given by the Argentine Scientific Society of Buenos Aires. In 1896 this society, in order to celebrate its twenty-fifth anniversary, decided to convene a Latin-American scientific congress.

This congress assembled in Buenos Aires on the 10th of April, 1898, and adjourned on the 20th day of the same month. Most of the Latin-American countries were represented. One hundred and twenty-one

papers were submitted, covering every branch of science. At the closing session, held on the 21st day of April, 1898, it was decided to hold the next congress in Montevideo in 1901, for which purpose a committee on organization was appointed, composed of 13 prominent Uruguayans.

The Montevideo congress assembled on the 20th day of March, 1901, and adjourned on the 31st day of the same month. The representation at this congress, both official and corporate, was larger than at its predecessor in Buenos Aires. There were 48 official or government delegates, 79 representatives of scientific corporate bodies, and 749 affiliated members. The number of papers submitted was also larger, the total reaching 163. At the closing session of the Montevideo congress, it was decided to hold the Third Latin-American Scientific Congress in Rio de Janeiro during the winter of 1905.

This congress assembled on the 6th of August, 1905, and adjourned on the 16th day of the same month. At the Rio congress there were 780 members. Although the number of papers was somewhat smaller, numbering 120, the first attempt was made to concentrate attention on a more restricted group of problems. At the closing session it was decided to hold the fourth congress in Santiago de Chile. The month of December, 1908, was agreed upon as the date and an organization committee was appointed, composed of a distinguished group of Chilean scientists.

The experience acquired during the Buenos Aires, Montevideo, and Rio congresses clearly demonstrated the necessity of limiting the range of discussion in order to bring to bear upon concrete scientific problems the accumulated experience of the countries represented. The Chilean committee, at its preliminary sessions, determined to select for the programme of the congress those questions which are of special interest to the countries of Latin America. The distinguished scientists in charge of the preliminary arrangements of the congress clearly saw that in the public and private law, in ethnology, archaeology, linguistics, and even in medicine and sanitation, there are problems that are distinctively American, and that the interchange of experience between the republics of this continent would be of the greatest possible value.

The plans for the congress had not proceeded very far, however, before it became manifest that the United States had quite as deep an interest in this group of problems as any of the Latin-American countries. It was determined, therefore, to broaden the scope of the congress, making it "Pan-American" instead of "Latin-American." The invitation issued by the Chilean Government met with a most cordial response in all the Latin-American countries, as well as in the United States.

In a memorandum submitted by the Secretary of State of the United States, the Hon. Elihu Root, to the President, dated December 19, 1907, the acceptance of the invitation of the Chilean Government was strongly urged, and in a special message to Congress, dated December 21, 1907, the President urged upon Congress to make provision for the expenses of the official delegation.

(For text of memorandum and message, see Appendix A.)

APPOINTMENT OF DELEGATES FROM THE UNITED STATES—ORGANIZATION OF THE DELEGATION AND PRELIMINARY SESSIONS.

Under act of Congress providing for representation from the United States the following official delegates were appointed:

Dr. Hiram Bingham, Yale University.
Dr. Archibald Cary Coolidge, Harvard University.
Col. William C. Gorgas, U. S. Army.
Mr. W. H. Holmes, Smithsonian Institution.
Dr. Bernard Moses, University of California.
Dr. Paul S. Reinsch, University of Wisconsin.
Mr. George M. Rommel, Department of Agriculture.
Dr. L. S. Rowe, University of Pennsylvania.
Dr. W. R. Shepherd, Columbia University.
Dr. W. B. Smith, Tulane University.

Secretary, Mr. Clarence L. Hay.
Assistant secretary, Mr. Charles G. Neumann.
Second assistant secretary, Mr. Huntington Smith.

At the organization meeting held in the diplomatic room of the Department of State on June 15, 1908, Dr. L. S. Rowe was chosen chairman and Dr. Paul S. Reinsch vice-chairman of the delegation.

The Secretary of State, who attended the organization meeting, stated that as this was a scientific and not a diplomatic congress, the Government had no binding instructions to give to the delegates. He stated, however, that there were several matters that he wished to impress upon the delegation.

REMARKS OF HON. ELIHU ROOT, SECRETARY OF STATE, TO THE MEMBERS OF THE DELEGATION OF THE UNITED STATES.

I am not going to keep you very long for the errand on which you are going is scientific and not diplomatic. There is one aspect of it, however, that I want to impress on your minds. It is that in many ways the interests of the United States are very much concerned in the advance of the other American countries. The advance of knowledge and improvement of practice among them in all sanitary matters is of great practical importance to us. Closer cooperation in commercial arrangements, in the administration of the ports, of customs, and of the machinery of trade intercourse, is of great practical moment. The increase of the prosperity of all the other American countries, which gives them greater purchasing power, is of advantage to us. There are great differences in the advancement of different American countries, and it is for the interest of all of them to have the highest standard, the most complete experience, and the greatest skill attained in any one, made the common property of all. The congress to which you are to go will afford this opportunity largely because being a congress of representatives of all the countries, the conclusions which are reached, the lessons which are learned, the things that are said there will go to each country, not as coming from a schoolmaster, an alien schoolmaster, whose dictation or assumption of superior knowledge would be resented, but from a body in which all concerned are represented. Such a meeting affords an avenue of access to the minds of all the peoples of all the countries which can not be obtained in any other way.

Many of the matters that will be discussed, according to the programme of this conference, are matters which while there discussed in their purely scientific aspects, will be later discussed on the political side before the next Pan-American conference, to be held in Buenos Aires in 1910.

Now, of course, I need not say to you that you ought not to go to Santiago empty-handed. You should take something there of value, something which each one of you can contribute to the common stock of knowledge for the benefit of all the countries represented, and I take it that the principal thing to be done by you to-day is to come to an understanding about what each one will do, the papers you will prepare, the papers you will be prepared to discuss, the sections of the congress to which you wish to attach yourselves. As the smooth working of the machinery which gets you there and a common understanding about what each is to do will require that

someone represent you, Professor Rowe has been designated to act as chairman of the delegation, and it will be his special function to see that the directions given by the delegation shall be carried out. Mr. Neumann, who is attached to the legation of the United States at Santiago, will probably act as assistant secretary.

You know, I dare say, that there have been a number of these scientific congresses in Latin America, but hitherto they have been exclusively Latin American. For the first time, under the influence of the new Pan-American entente, an all-American—a Pan-American—congress is to be held, and it is very desirable that we should contribute our fair share and that the work which you do and the associations which you form should contribute toward the establishment of permanently good relations and continue the work of doing away with the misapprehensions, jealousies, and suspicions which have so largely influenced the views entertained of this country in some of the Latin-American countries. I have no doubt that your experience there will be useful in that direction.

There will be a number of other delegates from the United States representing the universities of the country. One of the things which you will have to do will be to determine what relation is to be established with the other American delegates to the conference. My own judgment would be that as you go solely as delegates to a scientific congress, where there is no diplomatic function whatever, you should call in, as far as possible, the other delegates from the United States, without any reference as to whether you go representing the Government of the United States or whether you go representing this or that or the other university. Of course, if you do that, you will form a general organization, which will elect its own officers and adopt its own methods of organization, you bearing in mind your relations to the Government of the United States.

I think that this is all I have to say, except that I shall be very glad to answer any questions that any gentleman desires to ask and that I am competent to answer.

SESSIONS OF THE DELEGATION IN WASHINGTON.

During the meetings of the delegates held in Washington the character of the papers to be presented was discussed. It was agreed that the value of such contributions would be greatly increased if topics of interest to all the countries of the American continent were selected, and especially those in which the accumulated experience of the United States would be of value. In furtherance of this purpose it was decided to invite the cooperation of American investigators especially qualified to deal with such problems. To this invitation the delegation received most cordial response.

The members of the delegation from the United States desire to take this opportunity to express their appreciation for the valuable cooperation thus enjoyed. They are under special obligations to Mr. Calvin W. Rice, secretary of the American Society of Mechanical Engineers, through whose unselfish efforts the delegation was able to secure valuable papers from distinguished members of the American Society of Mechanical Engineers, the American Society of Civil Engineers, the American Institute of Mining Engineers, and the American Institute of Electrical Engineers. The list of papers contributed by delegates from the United States, together with those prepared by persons whose cooperation was requested by the delegation, will be found in Appendix B.

ASSEMBLING OF THE DELEGATION IN BUENOS AIRES.

The members of the delegation from the United States [a] assembled in Buenos Aires on the 10th of November, 1908. Soon after their arrival the delegates were received first by the Minister of Foreign Affairs,

[a] With the exception of Dr. Gorgas, who went to Santiago via the west coast of South America.

and later by the President of the Republic. A further audience was accorded them prior to their departure. On the occasion of these receptions both the President of the Republic and the Minister of Foreign Affairs expressed their gratification at the visit of a group of American scientists, which they regarded as marking the beginning of closer intellectual relations between the northern and the southern sections of this hemisphere. During their stay in the Argentine Republic the delegates enjoyed numerous courtesies, not only on the part of the Argentine Government, but also of the leaders in scientific and university life.

A special convocation of the National University of La Plata was held, at which addresses were delivered by the eminent president of the university, Dr. Joaquin V. Gonzalez, and by the chairman of the delegation. At this session the delegates were given an opportunity to meet the members of the various faculties. The delegates were also received by the medical faculty, the law faculty, and the faculty of philosophy and letters, of the University of Buenos Aires. A special session in their honor was also held by the Argentine Society of History and Numismatics. Through the courtesy of the mayor of Buenos Aires the members of the delegation were given every facility to visit the public buildings and other places of interest.

On the trip across the Andes the delegation was shown every possible courtesy. The minister of justice and public instruction, Hon. Romulo S. Naon, placed a special car at their disposal. During their stay at Mendoza, the governor of the Province, the Hon. Emilio Civit, extended to the delegates the freedom of the city and placed at their service special guides and interpreters for the purpose of visiting the places of interest within the city and in the immediate suburbs.

For these many courtesies the delegation herewith desires to express its appreciation, and particularly to record its obligation to Dr. Agustin Alvarez, vice-president of the National University of La Plata, for the self-sacrificing manner in which he devoted himself to the interests of the members of the delegation.

ASSEMBLING OF THE DELEGATION IN SANTIAGO.

The majority of the delegation arrived in Santiago on the 12th of December, 1908. They were there joined by the following delegates from American universities and scientific associations:

Dr. Albert A. Michelson, University of Chicago.
Dr. J. L. Laughlin, University of Chicago.
Mr. Orville A. Derby, Cornell University.
Dr. Thomas Barbour, Harvard University.
Dr. J. B. Woodworth, Harvard University.
Dr. A. Hempel, University of Illinois.
Dr. H. D. Curtis, University of Michigan.
Dr. C. W. Hall, University of Minnesota.
Dr. W. F. Rice, Northwestern University.
Dr. W. E. Browning, Princeton University.
Dr. D. E. Salas, National Educational Association.

An organization was then formed, including all delegates from the United States. During the days preceding the formal opening of the congress the delegation devoted considerable time to the consideration of certain questions submitted to it by the Association of American Universities.

ORGANIZATION OF THE CONGRESS.

The preliminary session of the congress for the purpose of effecting an organization was held on the afternoon of December 25, 1908, in the great hall of the National University of Chile. This session was opened by a brief address by the chairman of the organization committee, Dr. Valentin Letelier, rector of the National University of Chile. The election of officers was then proceeded with. The Minister of Justice and Public Instruction, and the minister of foreign relations of Chile were unanimously elected honorary presidents of the congress. It was also voted to declare honorary presidents the diplomatic representatives of American countries accredited to the Chilean Government.

The election of the regular officers of the congress was then proceeded with and resulted as follows:

President, His Excellency, the Brazilian minister, Dr. Enrique Riheyro de Lisboa.
First vice-president, His Excellency, the Argentine minister, Dr. Lorenzo Anadon.
Second vice-president, Dr. Federico Surveila S. Quash, delegate from Uruguay.
Third vice-president, Dr. Matias Manzanilla, delegate from Peru.

The following secretaries were also elected:

Dr. Emilio Fernandez, delegate from Bolivia.
Dr. Melchior Lazo de la Vega, delegate from Panama.
Dr. Enrique Martinez Sobral, delegate from Mexico.

The formal opening session of the congress was held on the evening of December 25 in the Municipal Theater of Santiago in the presence of the President of the Republic and Madame Montt, the ministers of state, and the assembled diplomatic corps. The delegates were greeted in the name of the President of the Republic by the minister of foreign affairs, the Hon. Rafael Balmaceda, who spoke as follows:

Delegates of the countries of America, ladies, and gentlemen: I have the honor to greet you in the name of His Excellency the President of the Republic and of the Government of Chile.

The cordial reception with which the invitation of the organizing committee of this congress has been favored by our sister republics is sufficient cause for congratulation and gratitude, and it is not less gratifying that the delegates have thus willingly taken upon themselves the fatigues and difficulties of a long journey to gather in this capital in a grand communion of spirit, of study, and of science.

This assembly of distinguished citizens of the New World, the knowledge of the countries they have visited that they carry to their homes, the personal relations they have fostered with the statesmen and men of science, the noble purpose which enabled them to gather in a common and noble search after truth, all this tends to bind the soul in a close communion of eternal friendship, to diffuse a sentiment of sincere fraternity which will show itself in a better acquaintance with one another and in a more intimate and profitable community of thought and action.

On many occasions have the American nations, with an almost inspired vision of the future, looked to the union of their interests. It is for these great intellectual assemblies which study the most difficult problems without prejudice or enmity, to stimulate more and more our enthusiastic calls for common culture and progress.

We sincerely believe that our energies work for good. Work and study ennoble the personality of nations; work dignifies the spirit, and study gives new vigor to the perception of duty and right. Thus will we be guided to the solution of many difficult problems, bringing us closer and closer to the ideals of liberty. Therefore, gentlemen, you have come to fulfill in the world of Columbus a very important mission of fraternity, progress, and liberty.

If our great sister, the United States of America, had the privilege of organizing itself and acquiring its independence before the other American nations were able to do so, if its progress, which is due entirely to the wisdom of its statesmen and the singular virtues of its people, compels the admiration of the whole world, it ought to be of

special interest for its delegates and for ourselves to study our weak points and our progress during the century of free and independent existence.

Only yesterday we gathered in a meeting of the nations which contributed within its sphere of action to the progress of universal civilization. Therefore it is of the utmost importance that we should study those problems which are characteristic of this continent and which are included in the programme of this august assembly.

The address of the minister of foreign affairs was followed by a brief report of the secretary of the organization committee, Dr. Eduardo Poirier, which was read by the treasurer, Dr. Octavio Maira.

REPORT OF THE SECRETARY-GENERAL, DR. EDUARDO POIRIER.

Mr. Chairman, ladies, and gentlemen: On but few occasions is one permitted to say that words are of little value where facts can speak for themselves. This is the case, however, on the occasion of the assembling in this capital of the Pan-American Scientific Congress. A few words will suffice to put before you these facts, which are all convincing.

As soon as the labors of our organizing committee began, the call of our country received the most complete indorsement from intellectual and scientific America, and we have consequently been able to bring together an assembly of great and distinguished men and a group of papers never surpassed in previous congresses.

The statistics of such a brilliant success are showing us that the Fourth Scientific Congress (First Pan-American) has the singular honor of seeing here gathered 65 official delegates and 97 delegates of the universities and institutions of learning of the American republics; that 145 institutions have pledged their adherence to our labors; that there are more than 500 contributors from America and more than a thousand from Chile. But the most important fact, that which goes furthest to show our continental culture, the number of papers announced in November as 477—285 of which are of this nation—has reached to-day the number of 600.

The organizing committee presents these figures with legitimate pride, which reflect such great honor on the culture of this continent and speak so eloquently for the intellectual discipline of the American spirit.

This was followed by addresses by the chairmen of the various delegations.

(For abstract of address of the chairman of the American delegation, see Appendix C.)

SECTIONAL MEETINGS.

The only general sessions were those held at the opening and closing of the congress, namely on December 25, 1908, and January 5, 1909. The intervening period was occupied by sectional meetings, of which detailed reports are submitted in Appendixes E to O, inclusive. At these sectional meetings the papers submitted by delegates were discussed, and, as a rule, their conclusions voted upon. The members of the delegation from the United States feel that this plan is open to some criticism. While it is within the province of a scientific congress to vote on resolutions relating to the promotion of scientific research and the diffusion of scientific knowledge, it is hardly within the scope of such a congress to approve or disapprove of the conclusions reached in every paper submitted. Furthermore, the fact that the conclusions of the sections are made the conclusions of the congress, has the additional disadvantage of committing persons who have not had an opportunity to take part in the discussions of a section, to the conclusions of such section.

RESOLUTIONS OF A GENERAL CHARACTER ADOPTED BY THE CONGRESS.

The most important resolutions adopted by the various sections of the congress are referred to in the sectional reports, annexed hereto.

In addition to these sectional resolutions, which at the final session were adopted by the congress as a whole, two resolutions were made the subject of discussion and adopted by the assembled sections in plenary session. Both of these relate to the Bureau of the American Republics, and read as follows:

RESOLUTION RECOMMENDING THE ESTABLISHMENT OF A SECTION OF AMERICAN BIBLIOGRAPHY IN THE INTERNATIONAL BUREAU OF THE AMERICAN REPUBLICS.

Recognizing the importance of establishing closer relations between investigators throughout the American continent and of disseminating the results of scientific investigations, the Pan-American Scientific Congress resolves to recommend to the governing board of the International Bureau of the American Republics:

1. That a special section be established in the International Bureau of the American Republics to be known as the "Section of American Bibliography."

2. That the director of the bureau invite authors and investigators to send their publications to the bureau, on receipt of which notice thereof will be published in the Bulletin, which notice shall include at least a brief summary of the content of such publication and the price thereof.

3. That the bureau secure for investigators any such publications at a price to be indicated in the Bulletin.

4. That the bureau endeavor as far as practicable to secure official publications for investigators.

5. That the bureau keep a record of the published progress of larger schemes of scientific investigations of Pan-American bearing; and that it strive to bring into closer contact investigators in the same or related fields.

RESOLUTION EXTENDING TO THE GOVERNING BOARD AND DIRECTOR OF THE INTERNATIONAL BUREAU OF THE AMERICAN REPUBLICS THE THANKS OF THE PAN-AMERICAN SCIENTIFIC CONGRESS FOR THE OFFER OF COOPERATION.

Whereas the Pan-American Scientific Congress has received with much satisfaction the cordial message of greetings from the Bureau of the American Republics, and the kind offer of cooperation, be it

Resolved, That the formal thanks of the congress be transmitted to the governing board and director of the bureau, and that it be recommended to the members of the organization committee of the next scientific congress to avail themselves in every possible way of the valuable services which the bureau can render.

At the closing business session of the congress, held on the afternoon of January 4, 1909, it was decided to hold the next congress in Washington in 1912. At the preceding congresses it had been the practice to appoint an organization committee for the next succeeding congress. It was suggested, however, by the delegation from the United States that, owing to the necessity of securing the active cooperation of a great number of national organizations, it would be well to depart from this practice and limit the action of the Santiago congress to the appointment of a provisional committee, which should take the necessary steps for the formation of a permanent organization committee in the United States. The desirability of such a course was recognized by all the delegates present, and as a result of this suggestion a provisional committee was appointed, composed of the following members:

Dr. L. S. Rowe, chairman.
The Director of the Bureau of the American Republics.
The Commissioner of Education of the United States.
Mr. William H. Holmes, Smithsonian Institution.
Mr. George M. Rommel, Department of Agriculture.

The functions of this committee will cease as soon as the permanent committee has been appointed.

The decision to hold the next congress in Washington places a heavy responsibility on the national scientific associations of the United States. The Latin-American countries will send their leading scientists and investigators to attend this congress. It is important, therefore, that the programme of the forthcoming congress be formulated with as little delay as possible, in order that special investigations may be undertaken, the results of which may be submitted to the congress and made the basis for the sectional discussions. Thus the Second Pan-American Scientific Congress can be made one of the most potent influences in fostering closer intellectual ties between the northern and the southern sections of the continent, and in strengthening the feeling of continental solidarity.

The Santiago congress has clearly demonstrated the desirability of concentrating attention on a relatively restricted group of problems. The adoption of this plan greatly increased the value of the discussions. It was the unanimous opinion of the delegates that this plan should be carried one step further at the Washington congress of 1912. If possible, the attention of the sections should be directed to a small group of problems of interest to all the republics of the continent. The comparison of the results of individual scientific investigations and the interchange of scientific opinion may thus be made to accrue to the benefit of all.

The final session of the congress was held on the afternoon of Tuesday, January 5. At this session the president of the congress, Dr. Enrique Ribeyro de Lisboa, delivered a brief address, in which he referred in terms of high praise to the results of the congress.

REMARKS OF THE PRESIDENT OF THE CONGRESS, THE HON. ENRIQUE RIBEYRO DE LISBOA.

LADIES AND GENTLEMEN: The scientific congress has to-day finished its labors and is to be congratulated on its success. Its labors have been of two kinds—one scientific, the other of a more social or international bearing. As far as the former is concerned, the secretary-general has just now given a full account of how the delegates, members of the nine sections, have worked together solving problems of common interest to the American nations and expressing their ideas in regard to problems, the solution of which will bring the peoples of this continent closer to one another.

It is not my purpose to enumerate the papers presented in these sections; they will all be published and the civilized world will recognize the labors of the delegates and will appreciate the value and effect of their studies.

I will now refer to that part of the congress to which I attributed an international character. This phase of the work has not appeared in the discussions of the various sections, nor does it appear in the programme or record of proceedings. Its effects have, nevertheless, saturated the atmosphere of this congress and have penetrated in our minds; its conclusions were unanimously adopted in the intimacy of our souls, and its records will be perpetuated in our hearts. Everyone of you, gentlemen, will on your return to your native shores carry the conviction that we are all brothers in America and that we came together to work in unison for the aggrandizement of this congress. You will tell your fellow-citizens of the harmony which reigned in our deliberations and the cordiality which guided all our studies. You will tell them that the word "foreigner" must be stricken from the American dictionary, that our intellects and hearts form now a perfect communion, and that spiritual and material differences have disappeared from between us. There is only one nationality from now on for our minds and that nationality is "American."

Gentlemen, in our session yesterday we decided that the next congress shall be held in Washington in the year 1912. There, under the banner of liberty, will this congress continue its work of civilization, there where useful science is supreme, where the enlightenment of its citizens and resourcefulness of its people every day find new

fields for development, there we shall take advantage of the lessons taught by a long and laborious experience in order to attain the object of these congresses. Let us prepare, therefore, to carry with us to the Second Pan-American Scientific Congress all the elements necessary to the betterment of our social condition.

To begin this we can count already on the organizing committee of the future congress. We know that that work will be carried out satisfactorily by the committee of which our fellow-laborer, Dr. L. S. Rowe, forms a part. His capability and the intelligent cooperation, of which he has given proof in these sessions, guarantee the success of his future labors for the next scientific congress, and we all know that it will not be less useful than has been the present for the great work of progress and of American harmony.

Gentlemen, I ask you to carry with you a pleasant memory of our cordial reunion and to proclaim in your countries that it is impossible now to dissolve our intellectual communion, which has been sealed here under the protection of the glorious Chilean banner.

Let us close the Fourth Scientific Congress—First Pan-American—with three cheers for the President of Chile, His Excellency Don Pedro Montt.

The main feature of this session was the address of the Minister of Public Instruction, the Hon. Eduardo Suarez Mujica, who spoke as follows:

REMARKS OF THE MINISTER OF JUSTICE AND PUBLIC INSTRUCTION HON. EDUARDO SUAREZ MUJICA.

YOUR EXCELLENCY, THE PRESIDENT OF THE CONGRESS, DELEGATES, LADIES, AND GENTLEMEN: The vast proportions of this congress having been fully impressed upon us through the publication of the minutes of the different sessions, its social and international significance has made a deep and lasting impression. It remains for the Government to add a few words to point out the importance of this historic gathering and of this fraternal reunion, which in the name of scientific investigation has brought together the noble missionaries of American intellectual effort.

America has enjoyed but a hundred years of freedom, a long period for the individual, but brief in the life of a nation. In this short time the American nations have through a gigantic effort established their social and civil organization after having overcome the many obstacles in their way, from revolutionary convulsions down to ignorance and poverty. They have now all enlisted in a friendly competition to reach the highest intellectual and moral standards. It is on this point, gentlemen, that I want to insist with the pride of an American on the greatest event of our continental life.

During the century of independent life, two revolutions have agitated America—the revolution of the sword, which gave us our liberty and allowed us to establish our nationalities, and the revolution of ideas, which at the end of a hundred years, has now come to strengthen and establish this other emancipation, without which material life is worth nothing, the emancipation of our intellect, the emancipation of our conscience. During these two revolutions a noble and sublime spirit of fraternity has guided and united the efforts of the heroic soldiers of progress.

We remember the great generals of America hurrying from one country to the other to carry on the great struggle of independence. Through that community of effort and sacrifice, the chains were broken one after another, and our new countries entered upon an independent life. Such was the military revolution.

With the same faith, with the same love for liberty, with the same cult of the right, with the same sentiments regarding what is true and good, we now see how a century later the soldiers of civilization and of thought gather and unite. Glorious leaders of the armies of investigation, legions of soldiers of science have now crossed the oceans and traversed the snow-covered mountains to unite their heroic efforts, which tend to affirm the no less noble and useful independence of thought.

The spectacle offered by this mutual helpfulness of the men of science of our continent both moves and cheers the soul and assures progress toward the highest standards of civilization.

As a man and publicist, I must confess that I was moved by this vision of scientific men journeying toward Chile, from the farthest regions of the continent, lead by the delegation of the United States as if it were the humblest of all these nations, and all of them coming full of enthusiasm to deposit their contribution on the altar of science. I can picture to myself the effect of this great assembly on the social, political, and material commerce of these nations. It will undoubtedly greatly diminish the obstacles to intercourse between the republics and will open broader horizons to a sincere friendship and community of interests. "Men are all equal in the cradle,"

said Victor Hugo. A boy is just like another boy, and it is only in adolesence and manhood that differences appear, due to differences in environment and moral and intellectual education. Thus it is with nations; while some prosper and advance with every year of independent life, others take longer to develop and organize.

It is for this reason that the efforts of a people in favor of the development of their sons constitute the most important factor in its own aggrandizement. I recall the graphic expression of President Garfield: "The greatness of a state must be measured by the number of its schools." It is true that the school is the first seed planted in the great mass of ignorant and uncultured humanity; it is the first call to the awakening of intellect and places men on the road which guides them to light and prosperity.

The efforts of the Government to diffuse science and knowledge in general has been lately greatly seconded by the interchange of ideas which in modern times has characterized the expansion of science. The scientific congresses represent the most important factor in this new tendency. The interchange of ideas enlightens obscure points, removes prejudices, and through united efforts science may be enriched and advanced. Until quite recently these manifestations of cooperation were scarcely known in Latin America and were carefully kept within the limits of the nations. While in Saxon America the principle of cooperation has always been in the foreground, in Latin America the dominant principle has until quite recently been quite the contrary.

We should rejoice, therefore, to be present at the historic moment when barriers are removed and when America unites all men of science in the study of the common problems of the American continent.

A Chilean association was formed some years ago, due to the initiative of an European, Mr. Alfonso Nogues, for the purpose of holding national scientific congresses. However interesting and useful the sessions of such congresses may have been, they did not extend beyond the limits of the Republic, and only enrolled a few foreign corresponding members, to which publications were sent. This comparatively small beginning, whose influence scarcely went beyond the limits of this country, had its effect, and some years later the Argentine Scientific Society successfully organized the First Latin-American Scientific Congress. During the last ten years four such congresses have been held.

Delegates, your presence here to-day will be remembered in Chile for all time to come. The Chilean Government and people have received you, if not with the pomp and splendor which you deserve, at least with open hearts and with the sincere wish that this congress may have strengthened the ties that bind together the nations of America. The part you have taken in the Congress has been brilliant and has given to this assembly great scientific prestige.

Your stay in Chile leaves in this country pleasant memories of sincere friendships and fraternal good feeling, and we hope that you will always remember this country with sincere affection. Your departure from our shores is looked upon by all Chileans with keen regret. I fulfill a personal duty, as well as an obligation of the Chilean Government, in asking you to carry to your respective countries the offer of Chile's friendship. You may rest assured that the high esteem which you have so richly deserved will not be diminished in the years to come.

The chairman of the delegation of the United States then expressed to the assembled delegates the appreciation of the American delegation for the honor done their country in the designation of Washington as the place of meeting of the Second Pan-American Scientific Congress.

(For the abstract of this address, see Appendix D.)

HOSPITALITY OF THE CHILEAN PEOPLE.

The members of the delegation desire to take this opportunity to express their appreciation and gratitude for the warm-hearted and generous hospitality of the Chilean Government and of the Chilean people. The cordial welcome given to each member of the delegation by the President of the Republic, the members of the cabinet, and other officials, will long be remembered by every member of the delegation. This hospitality was not confined, however, to official circles. Every member of the Chilean organization committee placed himself at the service of the delegates and in countless ways added to the

interest and pleasantness of the stay in Santiago. It is no exaggeration to say that every branch of the public administration was at the service of the delegates, a circumstance which was of special value to those who profited by their stay in Chile to make a study of local conditions. The good fellowship that prevailed throughout the congress, the close ties formed between the delegates from different countries, and the plans for united action which took definite shape during the congress, constitute some of the incidental and by no means least important results of this meeting.

CONCLUSION.

The delegation desires, in closing this report, to express to its secretaries, Mr. Clarence L. Hay, Mr. Charles G. Neumann, and Mr. Huntington Smith, its thanks for their faithful and conscientious service.

We have the honor to be, sir, your obedient servants,

L. S. ROWE, *Chairman.*
PAUL S. REINSCH, *Vice-Chairman.*
HIRAM BINGHAM.
ARCHIBALD CARY COOLIDGE.
WILLIAM C. GORGAS.
W. H. HOLMES.
BERNARD MOSES.
GEORGE M. ROMMEL.
W. R. SHEPHERD.
W. B. SMITH.

Hon. PHILANDER C. KNOX,
Secretary of State, Washington, D. C.

APRIL 23, 1909.

APPENDIXES.

Appendix A.

Message from the President of the United States Transmitting a Report of the Secretary of State in Regard to the Representation of the Government of the United States in the First Pan-American Scientific Congress to be held at Santiago, Chile.

To the Senate and House of Representatives:

I transmit herewith for the consideration of the respective Houses of the Congress a report of the Secretary of State representing the appropriateness of early action in order that in response to the invitation of the Government of Chile the Government of the United States may be enabled fittingly to be represented at the First Pan-American Scientific Congress, to be held at Santiago, Chile, the first ten days of December, 1908.

The recommendations of this report have my hearty approval, and I hope that the Congress will see fit to make timely provision to enable the Government to respond appropriately to the invitation of the Government of Chile in the sending of delegates to a congress which can not fail to be of great interest and importance to the governments and peoples of all the American Republics.

Theodore Roosevelt.

The White House, *December 21, 1907.*

The President:

The Government of Chile has invited the Government of the United States to join in and to be represented by delegates at the Pan-American Scientific Congress, which is to assemble under its auspices at the capital city of Santiago during the ten days beginning December 1, 1908. The work of the congress will comprehend nine sections, devoted, respectively, to pure and applied mathematics, physical sciences, natural sciences, engineering, medicine and hygiene, anthropology, jurisprudence and sociology, pedagogics, and agriculture and animal industry.

Latin-American scientific congresses were held in 1898 at Buenos Aires, in 1901 at Montevideo, and in 1905 at Rio de Janeiro. Growing out of these previous conferences the congress of 1908 will be for the first time pan-American. It will study and discuss many great subjects in which all the American Republics have in common special interests; and its aim is to bring together the best scientific thought of this hemisphere for the scrutiny of many distinctively American problems and for an interchange of experience and of views which should be of great value to all the nations concerned.

It is therefore eminently appropriate that the United States should be adequately represented at this important First Pan-American Scientific Congress and should embrace this opportunity for cooperation in scientific research with the representatives of the other American Republics. It is worthy of consideration that, in addition to the purely scientific interests to be subserved by such a congress and in addition to the advantages arising from an interchange of thought and the intercourse of the scientific men of the American countries and the good understanding and friendly relations which will be promoted, there are many specific relations arising from the very close intercourse between the United Statesand many Latin-American countries, incident to our expanding trade, our extending investments, and the construction of the Panama Canal, which make a common understanding and free exchange of opinion upon scientific subjects of great practical importance.

To make our representation possible I have the honor to recommend that the Congress be asked to appropriate the sum of $35,000, or so much thereof as may be necessary, to enable the United States to send a number of delegates corresponding to the number of sections into which the congress is to be divided, together with a secretary and disbursing officer, and to pay other necessary expenses.

Inasmuch as it is desired that all communications or scientific works to be presented to the congress be received before September 30, it is much to be hoped that provision for the participation of this Government may be made at an early date and that the appropriation be made immediately available.

Respectfully submitted.

Elihu Root.

Department of State,
Washington, December 19, 1907.

Appendix B.

List of Papers Presented to the Pan-American Scientific Congress.

BY DELEGATES OF UNITED STATES GOVERNMENT.

L. S. Rowe, professor of political science, University of Pennsylvania: 1. "Public opinion as a factor in our American Democracies." 2. "The influence of city environment."
Paul S. Reinsch, professor of political science, University of Wisconsin: "America's contributions to international law."
Hiram Bingham, instructor in history, Yale University: "A few reasons why the English colonists on achieving their independence became a single nation, while the Latin-American colonies did not form a federation or even a confederation."
Archibald C. Coolidge, professor of history, Harvard University: "America in the Pacific."
William C. Gorgas, member Isthmian Canal Commission: "Sanitation in the Tropics, with special reference to malaria and yellow fever."
W. H. Holmes, Chief Bureau of Ethnology, Smithsonian Institution, Washington, D. C.: 1. "Origin of the people of America." 2. "Antiquity of man in America according to geological and anatomical investigations."
Bernard Moses, professor of political science, University of California: "The bases of Spanish and English colonial civilization in America."
George M. Rommel, Bureau of Animal Industry, Department of Agriculture: 1. "Methods of instruction in animal husbandry in the agricultural colleges of the United States." 2. "Sanitary animal police in the United States."
William R. Shepherd, professor of history, Columbia University: "The adaptation of teaching to the American social medium."
William B. Smith, professor of philosophy, Tulane University: 1. "New theories of physical phenomena." 2. "Racial decay."

BY UNIVERSITY DELEGATES.

W. F. Rice, Northwestern University: "Tendencies in the education of women befitting the social mission that she has to perform in America."
Thomas Barbour, Harvard University: "Recent studies in experimental evolution."
H. D. Curtis, University of Michigan: "Astronomical problems of the southern hemisphere" (3 papers).
Albert A. Michelson, University of Chicago: "Recent advances in spectroscopy."
Jay Backus Woodworth, Harvard University: "The Shaler Memorial Expedition."
Christopher H. Hall, University of Minnesota: 1. "Origin of American prairies." 2. "Origin of Minnesota iron ores."
A. Lawrence Laughlin, University of Chicago: "Gold and prices."

BY AMERICAN SCIENTISTS NOT PRESENT AT THE CONGRESS.

William H. Burr, professor of civil engineering, Columbia University: "Concrete constructions for South America."
Dr. H. R. Carter, Marine-Hospital Service, Panama: "Modern advaucement in tropical sanitation."
Dr. Simon Flexner, Director of the Rockefeller Research Laboratory: "Investigations in spinal meningitis."
Allen Hazen, New York: "Supply of potable water."
Alcee Fortier, Tulane University: "Some phases of the early history of Mexico and Central America."
Walter R. Ingalls, editor Engineering and Mining Journal, and Dr. R. W. Raymond, secretary American Institute of Mining Engineers: "Mineral Wealth of America."
James F. Kemp, professor of geology, Columbia University: "New geological doctrines on subterranean waters."
William Kent, "Economy in fuel."

E. W. Kemmerer, professor, Cornell University: "The establishment of a stable currency in the Philippine Islands."
Dr. Charles E. Lucke, director of the department of mechanical engineering, Columbia University: "Value of gas power."
Francis E. Leupp, Commissioner of Indian Affairs: "Treatment of Indian tribes in the United States."
C. O. Mailloux, New York: "Pan-American terminology."
Henry S. Munroe, professor of mining, Columbia University: "Statistics of the use of nitrate of soda in the United States."
S. N. D. North, Director of the Census: "Uniformity and conformity in census methods."
F. H. Newell, chief of Reclamation Service, Department of the Interior: "Reclaiming of arid lands in the United States."
J. C. Perry, Marine-Hospital Service, Ancon, Canal Zone: "Plagues: New methods of control."
Roscoe Pound, Illinois Law Review: "Unification of commercial law in America."
M. J. Rosenau, director Hygienic Laboratory, Marine-Hospital Service, Washington, D. C.: "Recent advances in the study of typhoid fever."
William M. Sloane, Columbia University: "Recent tendencies in historical writing in the United States."
Frank J. Sprague, New York: "Electricity in railways."
R. M. Dixon: "Car lighting in America."
W. J. Wilgus, New York: "Plans and gauges of intercontinental railways."
W. H. Blauvelt, New York: "Use of tertiary coal in general metallurgy and in the manufacture of coke."
Allen Hazen, New York: "Water supply in cities and towns."
Rudolph Hering: "The supply of potable water."
Prof. David Todd, Amherst College: "Standard time system."

Appendix C.

Abstract of Address of the Chairman of the Delegation of the United States, Dr. L. S. Rowe, at the Inaugural Session, December 25, 1908.

Your Excellency, Ladies and Gentlemen: This congress possesses an historical significance which it is difficult for us to appreciate at the present time. It marks an epoch in the intellectual development of the American Continent.

Complete isolation from one another has characterized the situation of the countries of this continent. This isolation has been one of the greatest obstacles to progress. The failure to develop a spirit of intellectual cooperation has resulted in a great loss of energy and has been one of the most serious obstacles to the solution of many problems which would long ago have been solved had we been able to unite our energies and profit by each other's experience. The true scientific spirit has a far deeper significance than the mere desire to conduct investigations. It can not reach its highest expression if there exist petty rivalries or jealousies. For this reason, the development of the scientific spirit contributes so much to the growth of a true international fraternal spirit. Vigorous cooperation among the scientists of the American Continent will enable us to destroy the last trace of the epoch in which the words "stranger" and "enemy" were synonymous.

The industrial development of the last century offers lessons of much importance to the scientific world. A study of the economic growth of modern countries clearly shows that the principle of competition is gradually giving way to the principle of cooperation. The formation of trusts, as well as the growth of trades unions, constitutes the concrete expression of these new tendencies. The eighteenth century and a considerable portion of the nineteenth were dominated by a spirit of individualism. For more than four generations it was taken for granted that human progress is dependent on the struggle for existence and the conflict between individual and individual. During the nineteenth century the application of biological principles to human society strengthened this idea. It is the mission of the twentieth century to demonstrate that we must regard the principle of cooperation rather than that of competition as the fundamental principle of social progress.

In this congress it is our high privilege to inaugurate a new epoch giving concrete form to the idea of intellectual cooperation. In the International Bureau of American Republics we have a central organization admirably adapted to contribute toward the realization of this idea. We need such a center in order to place investigators in different portions of the American Continent in contact with one another and in order that the results of such investigations may be made the common property of all the nations of America.

In the name of the delegation of the United States of America I desire to express our sincere thanks for this opportunity to take part in the deliberations of this congress. No better opportunity could have been offered to become acquainted with our colleagues and fellow-investigators. The ties here formed possess a significance far deeper than the personal satisfaction which they imply. This visit can not help but enlarge our mental horizon, broaden our scientific activity, and strengthen the influence of our university instruction. We congratulate ourselves on the privilege of being present, and desire also to express our appreciation of the great service performed by this Republic in giving such vigorous impulse to the spirit of scientific solidarity.

Appendix D.

Abstract of Address of the Chairman of the Delegation of the United States at the Closing Session, January 5, 1909.

Mr. President, Ladies and Gentlemen: The honor conferred upon my country through the designation of Washington as the next meeting place of this great assembly is the more significant because of its spontaneous character. For this demonstration of confidence, good will, and fraternal solidarity I want to thank you, not only in the name of the delegation of the United States of America, but also on behalf of that larger body of scientists and investigators who are imbued with the same spirit that has actuated this congress and who now look forward to the privilege of welcoming to our shores the men upon whose efforts the progress of our American civilization depends. We can not hope to surpass the hospitality of this great Republic, but we can assure you that the welcome will be no less sincere and the determination to place every possible facility at your disposal no less effective than has been the case here in Chile.

Viewed in its proper perspective, this congress has been one of the most extraordinary assemblages of modern times; more extraordinary in many respects than either The Hague or the Pan-American conferences. That a large group of men, representative of every section of a great continent, should be able to get together and, casting aside all petty prejudices, freely and frankly exchange the results of their careful investigations and ripe experience is not only a tribute to the culture of this continent, but is also an indication of the extent to which our ideas have advanced beyond those which we inherited from our European mother countries.

The fact that we have met to place the results of the best scientific thought at the disposal of all the countries here represented, and through them at the service of the civilized world, contains a lesson of deep and lasting import which no other assembly of modern times has been able so clearly to impress upon the civilized world.

The historian of the intellectual development of the American Continent in reviewing the work of these assemblies will probably give to the Santiago congress the honor of having clearly demonstrated that the Republics of the American Continent, because of their geographical position, because of the peculiar conditions under which they were settled, and because of the special racial problems which they present, are confronted by a series of problems distinctively American. The mere fact of the existence of these problems involves an obligation not only to ourselves but to the civilized world to concentrate our efforts upon their solution. Through their solution we can make that contribution to the progress of mankind which the world has the right to expect of us.

We can best hope to do this by carrying to our respective countries the spirit that has hovered over this congress—that of service in its broadest and highest sense. This spirit of service must be made the keynote of our national and of our international relations. The Republics of the American Continent must demonstrate to the civilized world that the willingness and determination to be of service to our fellow-men is the corner stone of a philosophy which the nations of this continent are determined to make the guiding principle of their conduct.

I can see a time, not far distant, when with each conquest of science the question will immediately arise in the mind of every American, "How can these results be made of service to the democracies of this continent?"—a time when in every field of endeavor the American Republics may call upon one another for counsel in the solution of their problems and be certain to receive the best expert advice. Then, and not till then, will we have developed a real continental spirit; then, and not till then, will we have fulfilled the obligations which our privileged position in the world's affairs has placed upon us. I can imagine no greater distinction for the next congress than the possibility of marking a further step in the development of this spirit of service and of continental solidarity.

And now, in closing, let me again extend the thanks of the delegation of the United States of America to you, the members of the organizing committee, for your broad grasp of the purposes of the congress and the skill with which these purposes have been made real and effective; to you, our colleagues, for your cordial reception of newcomers in your midst; and, finally, to the Government and people of Chile for the warm-hearted hospitality which we have enjoyed.

Appendix E.

Report on Section 1: Pure and Applied Mathematics, by Mr. H. D. Curtis.

The representation of the Spanish language in Jahresberichten and other summaries of publications in mathematics, geodesy, and astronomy is at present much smaller than would be expected from a consideration of the proportion of the world's population which employs that language, a disproportion much more marked than obtains in such subjects as medicine, the political and social sciences, history, etc. For the future development and growth of the mathematical sciences in South America there is, moreover, an urgent need for the multiplication of treatises and text-books for purposes of instruction. In view of the above conditions, the representation in the section of pure and applied mathematics must be regarded as very encouraging. On the educational side special reference should be made to the four published volumes on algebra, geometry, trigonometry, and topography, submitted by Padre Francisco Cerro, S. J., of Bolivia.

Geodesy was perhaps better represented than any other branch of the mathematical sciences. Of especial interest and value were the papers presented by Dr. Luis Risopatron on the cartography of the boundary between Chile and Argentina, and the preliminary magnetic map made by him from the results of the work of the boundary commission.

The following general resolutions were adopted by the section:

Geophysical observatories.—The scientific congress recommends the establishment of geophysical observatories by the nations as yet unrepresented in this field.

Cartographic surveys.—The scientific congress urges countries making general cartographic surveys to collect at the same time as complete magnetic data as may be possible.

Military science.—The scientific congress recommends the inclusion of students of military science in the next scientific congress, for which purpose there should be created a "section of military and naval science."

Geodesic triangulations.—The scientific congress urges upon the governments of America that such geodesic triangulations as may be undertaken shall conform to the recommendations of the International Geodetic Association in order that these may be available in the determination of the terrestrial geode.

Uniform scale for maps.—Having in view the benefit which will accrue to all fields of science from a detailed study of the American Continent and the appropriateness of carrying out such studies in conformity with a definite scientific programme, the scientific congress recommends (1) that the maps of the American governments be published on a scale not inferior to 1 : 1,000,000 and referred to the meridian of Greenwich in accordance with the request of the geographical congress of Berne; and (2) that the geodesic surveys being carried out in America be made to conform to the rules of the International Geodetic Association, and that as soon as possible similar investigations be initiated in the other South American countries, giving to them an importance commensurate with the extension of the respective territories involved.

Universal time system.—A resolution submitted by Prof. David Todd, of Amherst College, was unanimously adopted:

Whereas (1) in the relations between the peoples of the world, diplomatic, commercial, or other, a standard system of time is a common and well-recognized benefit to all; and whereas

(2) The world standard of universal time, based on the division of the globe into hourly belts reckoned from a common origin, has now been in use with indisputable advantages since November 18, 1883, in certain countries; and whereas

(3) Practically all the European countries, Egypt, South Africa, India, Burma, Australia, Japan, New Zealand, Canada, the United States, and other countries, have already adopted this system of universal time; and whereas

(4) The necessary time signals are now sent out daily, with all essential accuracy and without cost, throughout the American Continent by cable or wireless telegraphy:

Be it resolved, That the First Pan-American Scientific Congress urge upon such governments as may not have taken this step the adoption of the universal time system, referred to the meridian of Greenwich, to be effective from the 1st of January, 1910.

Division of day.—The Pan-American Scientific Congress recommends that the various American governments from the 1st of January, 1910, adopt, in their official relations, the system of enumerating the hours from 0 to 23; the hour 0 corresponding to midnight, mean time.

Arc of meridian.—Resolved, that the scientific congress recommend to the South American Governments the holding of a joint conference to arrange for the measurement of a South American arc of meridian of great length in accordance with the resolutions adopted by the International Geodesic Association and the recommendations to this end adopted by the geodetic conference in Budapest; and that it considers necessary the establishment of a central geodetic institute in this portion of the continent.

Review of pure and applied mathematics.—The scientific congress deems advisable the foundation of a South American review of pure and applied mathematics, whose publications would be limited to higher mathematics, geodesy, astronomy, physics, the technical applications of mathematics, and mathematical bibliography, and would recommend that this be placed under the control of the central geodetic institute as soon as this may be established in accordance with the preceding resolution.

Appended to this report is a complete list of the titles of all the papers presented to this section.

PAPERS PRESENTED.

Domingo V. Santa Maria, Chile: "Subterranean waters of torrential rivers. Experiences in Chilean rivers."
Luis Risopatron, Chile: "An endeavor at the magnetic chart of the Andes between the parallels 17 and 52."
Francisco Jose Duarte, Cuba: "Studies on analysis."
Valentin Gama, Mexico: "Fundamental principles of mechanics."
Julio A. Garavito, Colombia: "Critical study of a scientific paper."
Francisco Diaz Rivero, Mexico: 1. "Questions arising out of rational mechanics." 2. "Geographic length of Ures calculated by the occultation of stars."
H. D. Curtis, United States: "Astronomical problems of the Southern Hemisphere: (*a*) The velocity of southern stars with inherent great movements. (*b*) Double southern stars discovered with the spectroscope of Mill's expedition."
Carlos A. Hesse, Chile: "Plan of a change of the calendar."
Marcel Lechaud, Chile: "The duration of a lunar period—does it allow to calculate the distance of the moon to the earth in the absence of all other astronomical data?"
Regino Guzman, Mexico: "Supplying Guadalajara with water. The sanitation and drainage of the city."
Federico Villareal, Peru: "Determination of the place and magnitude of the strength that can be resisted by burdened poles."
Francisco Cerro, Bolivia: "Pure and applied mathematics."
Luis Risopatron, Chile: "Present state of the mapping of America."
Ernesto Medina, Chile: "Monography of the military chart of Chile."
Felix Deinert, Chile: "Measuring of the geodesic basis of Chinigue."
A. Knudsen, Chile: "Foundation of rational energetics through deduction of kinetic equations of pure energetic principles of Newton."
Echeagaray and Allen, Mexico: "A straight line for the study of geometry."
Federico Villareal, Peru: "Theory of unchangeable numbers in subtraction and addition."
Adilia Palacios, Mexico: "Use of high mathematics."
Felipe Rivera, Mexico: "Photography in astronomy—History of its development—Its special uses—The future of astronomical science."

Appendix F.

Report on Section 2: Physical and Chemical Sciences, by Dr. W. B. Smith.

The work of the section of physical and chemical sciences at the First Pan-American Scientific Congress was accomplished in five sessions of three hours each, at which the average attendance was not less than 30. The discussions took a rather wide range, as indicated by the list of papers presented and by the general conclusions attained and recommendations adopted.

It will be at once observed that a very large share of attention was given to matters of practical science and even of more or less local interest. Thus, the subject of the nitrate industry, of such vital import to the commerce and development of Chile, very naturally and properly bulked largely in the deliberations of the section. One session was devoted exclusively to the presentation of its various aspects, a session marked by full attendance and by lively participation. The matter of adulteration of foods, along with related themes, was also discussed at much length, particularly by Doctor Mourgues, who exhibited extensive tables of the work done at his institute, and aroused notable interest. The more strictly pedagogical topic of the proper aim, scope, and method of instruction in physics and chemistry, in secondary and in higher courses, both liberal and professional, was debated with more earnestness and at greater length than any other single topic and developed sharper antagonisms in the ideas expressed. The general attitude of the section was made sufficiently clear in the conclusions adopted, and a transformation in methods of instruction, parallel to that going on so extensively in the United States, may be confidently awaited, where it is not already in progress, in Latin America.

The more general and theoretic aspects of the matters within the purview of the section were represented more particularly by four papers offered by Professors Ducci, Leguizamon, Michelson, and Smith. Of these the first dealt with the new theories of physical phenomena, presenting a luminous historical sketch of the growth of theories of electric action from about the year 1833 down to the determinations (of Kaufmann and Abraham) that ground experimentally the notion of the electric mass of the corpuscle. The second, a work already in print, on the subject "The rare earths," exhibited a table in which these were grouped in a double series apparently affording a striking exemplification of the periodic law (Mendelyeev). On the basis of this arrangement Professor Leguizamon ventured to announce the existence and general properties of a hitherto undiscovered element, which he named in advance and to the search for which he invited the cooperation of chemists interested in such pursuits. The significance of Professor Leguizamon's idea received recognition in one of the conclusions.

The weighty memoir offered by Professor Michelson on "Recent advances in spectroscopy" followed out the course of thought and invention in that field of research down to the present moment, indicating also the intellectual processes and mechanical agencies by which that savant had himself contributed so notably as well as so recently to the perfectionment of that branch of exact science. The elaborate paper submitted by Professor Smith on "New theories of physical phenomena (The electronic theory—Its true scope from the point of view of physical speculation)," a theme proposed in these terms in the original published programme of the congress, formed by singular chance a continuation of the paper presented by Professor Ducci, beginning where this latter ended and expounding the corpuscular theory, associated more especially with the names of Thompson and Kaufmann, in its various bearings, physical, chemical, astronomic, biologic, and philosophic. Kindred communications, read by title only or in brief résumé, dealt with "New theories of electric phenomena," by Victor Delfino; "Determination of the velocity of gaseous molecules," by Marcel Lachand; "Synthesis of modern science," by Alberto Aldana; "Morphogeny—Generation of round bodies," etc. There was also summarized an interesting memoir by Horacio Damianovich on "Experimental application to biology of the chemical physics of the colloids," a memoir illustrated by numerous photographs. The subject of wireless telegraphy, especially in mountainous regions, was treated briefly but impressively by Señor Tamayo, official delegate of Peru.

The extent and variety of the subjects discussed, the sustained interest in the meetings, and the intimate knowledge of the matters in hand displayed by contributors, would seem to argue well for the future of physics and chemistry in the countries represented.

CONCLUSIONS.

(1) The Fourth Scientific Congress (First Pan-American), in the interest of the industrial arts and of progress in general, recommends to public authorities that imposts affecting industrial products be laid upon the raw material and not upon the finished products.

(2) The Fourth Scientific Congress (First Pan-American) recommends to American Governments the establishment of meteorological services that may serve as the foundation for the formation of a Pan-American meteorological service, which is likewise recommended.

(3) The Fourth Scientific Congress (First Pan-American) recommends to the Governments and the learned societies of America the study of the problems, theoretical and practical, that relate to wireless telegraphy and its use in mountainous regions, where ordinary telegraphic communication is difficult to establish or to maintain.

(4) The Fourth Scientific Congress (First Pan-American) recommends to the Governments and the intellectual workers of this continent the works and conventions of the Brussels International Bureau of Bibliography, in order to facilitate as much as possible bibliographic investigation.

(5) The Fourth Scientific Congress (First Pan-American) recommends to public authorities the ozonization of drinking water as the best means of sterilizing it.

(6) The Fourth Scientific Congress (First Pan-American) declares that the basis of instruction in chemistry, in secondary and in higher courses, should be direct experimentation by the pupil, and that the time allotted thereto should not be less than half of that which is available for instruction in that branch. Accordingly it recommends to the Governments and to institutions of learning the adoption of a method of study suited to the spirit of the science and based upon direct experimentation by the student.

(7) The Fourth Scientific Congress (First Pan-American) recommends the use of a uniform chemical nomenclature, conformably to the convention of Geneva (1892), and proposes the nomination of a Latin-American commission, whose duty it shall be to present at the next congress a joint study of how to apply existing agreements most in harmony with the genius of the Castilian language.

(8) The Fourth Scientific Congress (First Pan-American) recommends to American Governments and learned societies the adoption of the conclusions reached by—

(*a*) The six international congresses of applied chemistry, especially in respect to methods of analysis.

(*b*) The first international congress for the suppression of adulterations in foods and drugs, assembled in Geneva in 1908.

(9) The Fourth Scientific Congress (First Pan-American) recommends in the interest of the nitrate industry that the sale and purchase of its product be based upon the quantity of nitrogen contained and according to a proportional scale.

(10) The Fourth Scientific Congress (First Pan-American) recommends the temperature of 15° C. as the standard for the calibration of instruments and apparatus used in laboratories and industries.

(11) The Fourth Scientific Congress (First Pan-American) requests of governments and institutions the creation of an office of exchange and reference in connection with the principal libraries of American capitals, to which authors be invited to send two copies each of all their publications. At the same time it suggests the creation in each country of a commission to carry out this idea.

(12) The Fourth Scientific Congress (First Pan-American) recommends the appointment of a permanent Pan-American committee with the following functions:

(*a*) To enter into relations with the international committee of analysis, with the directory of the congresses of applied chemistry, and with that of the congresses for the suppression of adulteration in foods and drugs.

(*b*) To compile data on methods of assay and analysis and to make the necessary tests of methods of assay and analysis before proposing them for adoption in cases at law.

(*c*) To revise the Codex Alimentarius Americanus.

(13) The Fourth Scientific Congress (First Pan-American) recommends the formation of a Pan-American Society of Physics and Chemistry, intended to unify the work in each country and to present the results of investigation, and at the same time the establishment of a bibliographic review, to serve as organ of the society.

(14) The Fourth Scientific Congress (First Pan-American) recommends to governments and institutions of learning, as a means of promoting the industrial and intel-

lectual progress of American nations, the foundation of independent institutes and laboratories of physics and chemistry, pure and applied, in all departments, which shall be devoted to scientific study and investigation and to the teaching and application of the sciences named.

(15) The Fourth Scientific Congress (First Pan-American), in order to give effect to the conclusions numbered 7, 8, 13, 14, and eventually to any other conclusion of the second section (of physical and chemical sciences), nominates the following committee:

Profs. Arturo E. Salazar, Carlos Malsch, Francisco Lerrat, Dr. Luis E. Mourgues, Profs. Pablo Martens, Belisario Diaz Ossa, Dr. José Ducci Kallens.

It shall be the duty of this committee to promote the appointment of similar ones in the other countries of America, having recourse for this end to the institutions and delegates represented in this congress. It shall be its further duty to report to the proper section of the congress at Washington in 1912, where a committee shall be named to supplant it

RECOMMENDATIONS.

(1) The section of physical and chemical sciences of the Fourth Scientific Congress (First Pan-American) recommends the study of the conditions under which may be employed the method of Clayton for sterilizing foods, especially the farinaceous, taking account of the fact that in those latter there seem to exist certain micro-organisms that should not be destroyed along with the infectious germs.

(2) The section of physical and chemical sciences of the Fourth Scientific Congress (First Pan-American) calls the attention of chemists generally to the existence of an undiscovered element having the following properties:

It will be an element of the group of rare earths, or with similar properties. Its double sulphate with potassium will be soluble. Its salts will not give an absorption spectrum. Its oxide will have the formula E_2O_3. It will have small basicity, like Ytterbium and Indium. Its salts will be colorless. It will be radio-active and in higher degree than uranium and thorium. It may be named Ekaitterbium.

(3) The section of physical and chemical sciences of the Pan-American Scientific Congress recommends to physicists the experimental study of the general law of the fall of bodies in the air, as related both to mass and surface, in view of the important connections between this problem and that of aviation.

(4) The section of physical and chemical sciences of the Fourth Scientific Congress (First Pan-American) recommends to chemists the use in their works and memoirs of the most appropriate notation and urges the proposal, at the next congress, of plans for its unification.

PROGRAMME OF THE SECTION OF PHYSICAL AND CHEMICAL SCIENCES.

December 26, 1908.

W. B. Smith: "New theories of physical phenomena."
Alberto Aldana: "Synthesis of modern science."
Marcel Lachand: "Determination of the velocity of gaseous molecules."
Manuel O. Tamayo: "Wireless telegraphy in Peru."
Horacio Damianovich: "Experimental application to biology of the physical chemistry of the colloids."
J. L. Huergo: "Morphogeny-generation of round bodies."
Herrero Ducloux: "Contribution to the study of the genesis of oils, etc."
Victor Delfino: "New theory of electrical phenomena."

December 28, 1908.

Albert A. Michelson: "Recent advances in spectroscopy."
Herrero Ducloux: "Alkaline mineral waters of the Argentine Republic."
Horacio Damianovich: "Constitution of the albuminoids."
Alberto Munich: "Phenomenon of silent electric discharge in a cumulus, registered by photography."
B. S. Urzua: "Study of the physics of the flight of birds, as related to aerostatics."
Benjamin Burela: "Theories of solar heat."
Charles F. Munroe: "Statistics of the use of nitrate of soda in the United States."
Diaz Ossa. "Electrolysis of solutions of nitrate of sodium."
Ramon Gonzalez: "Analysis of the mineral waters of Urmuri."

December 29, 1908.

Jorje Magnin: "On a method of dosification of substances precipitable by virtue of their densities, applicable especially to such as are difficult to filter."
Carlos Malsch: "Desirability of uniform methods of assaying and analysis in cases at law."
Herrero Ducloux: "Studies of the supposed scorias and baked earths of the pampa series."
Martiniano Leguizamon: "The rare earths."
Herrero Ducloux: "Instruction in chemistry in the University of La Plata."
Diaz Ossa: "Instruction in chemistry in the lyceums and schools preparatory to the university."
Wenceslao Cordero: "Correspondence schools."
Francisco Servat: "Concerning the teaching of chemistry in secondary schools."
Jorje Westmann: "Chemical notation and nomenclature."

December 30, 1908.

Manuel Pastrana: "Importance of establishing a Pan-American meteorologic service."
Joaquim Costa da Senna: "Mineral wealth of the State of Minas Geraes, Brazil."
Jorje Magnin: "On the alteration of flour disinfected by Clayton's method." "On an apparatus for demonstrating the absorption of gases by carbon or other absorbent substances, at low temperatures."
Doctor Gugliamelli: "Constitution of the latent image."
Delano y Oehlmann: "Spontaneous explosion of powder dust at Batuco."
Martiniano Leguizamon: "Artificial silk derived from caseine."

December 31, 1908.

Diaz Ossa: "Improvements attained in the nitrate industry."
Luis E. Mourgues: "On the desirability of selling nitrate by the unit of nitrogen."
Francisco Servat: "On a process for determining nitric acid, especially applicable to assaying natural nitrates."
Lorenzo Sundt: "The formation of saltpeter and the accompanying salts."
Enrique Kaempher: "Observations on the nitrate industry."
Other papers on the technique of the nitrate industry.

January 2, 1909.

Guajardo Amador: "Codex Alimentarius."
José Ducci: "New theories of physical phenomena."
Francisco Servat: "The desirability of adopting uniform terminology in chemical nomenclature."
Luis E. Mourgues: "The works of the laboratory Mourgues, etc."
Herrero Ducloux: "Calorimetric data of Argentine butter."
José Grossi: "The climate of the coasts of Chile."
Alberto Larenas: "Desirability of creating a faculty of pharmacy."
Several other papers were presented by title only, or in the briefest abstract.

Appendix G.

Report on Section 3, Subsection 1: Anthropology and Ethnology of the American Races, by W. H. Holmes.

Section 3 comprises the entire range of the natural sciences, including anthropology and ethnology. Seven sessions were held, and the papers, which had been placed on the programme without classification as to subject-matter, were presented in the main in accordance with the printed programme. The reading was concluded at the meeting of January 4.. The section was well attended, the number present averaging about 30.

Thirty-two papers treating of the American aborigines were listed. A few of these were not received by the section, while others were read by title only. The majority were read in complete form or in extended abstracts, and in a number of cases interesting discussion followed the presentation. A majority of the papers dealt with special and somewhat local phases of the subject, a few only having a general pan-American scope. Titles added during the sittings of the section brought the whole numher of papers up to 40. The list of titles is as follows:

Nicolas Armentia, Bolivia: "The Mosetenes Indians and their language. Tacana, art, vocabulary, and exhortations. Civimeña or Cavina art and vocabulary."

Alejandro Cañas Pinochet, Chile: "Studies of the Velichean language, with a dictionary of that language. Studies of the anthropology and ethnology of the primitive inhabitants of the Tierra del Fuego."

Belisario Diaz Romero, Bolivia: "The ruins of Tiahuanaco."

Alfredo Orrego Escuti, Chile: "Prehistoric America ."

Florentino Ameghino, Argentine Republic: "Fire-baked products of human origin in the neogene formations of the Argentine Republic."

Tomás Guevara, Chile: "Religious beliefs of the Chilean aborigines. American Ethnographic Museums."

W. H. Holmes, United States: "The peopling of America."

Samuel A. Lafone Quevedo, Argentine Republic: "Argentine ethnography. Some types of Cachaqui pottery."

Richard E. Latcham, Chile: "A chapter in Chilean prehistory. Indigenous races of the territory now occupied by Chile. Physical characteristics of the Chilean Indians."

R Lehmann-Nitsche, Argentine Republic: "Anthropological studies of the Guayaqui Indians. Anthropological studies of the Chiriguanos, Chorotes, Matacos, and Tobas Indians."

Antonio Lorena, Peru: "On the anthropology of the Cuzco region."

Francisco P. Moreno, Argentine Republic: "The land and man in the extreme south of America."

Feliz Outes, Argentine Republic: "Discovery of Mexican pottery in the Province of Buenos Aires. Study of the supposed artificially baked earths of pampean formation of Argentine."

Arturo Posnansky, Bolivia: "Races and monuments of the Andean plateaus."

Cárlos E. Porter, Chile: "Bibliography of Chilean anthropology and ethnology."

P. Flores, Chile: "On the study of folklore."

Pablo Patron, Peru: "The Allentine language."

José Miguel Barriga, Chile: "Origin of the Araucanian language."

Souza Brito, Brazil: "Anthropology and ethnology of the American races. The man of America according to geologic and anatomic investigation."

Max Uhle, Peru: "The sphere of influence of the land of the Incas."

Luis Vergara Flores, Chile: "Artificial deformation of the crania of Quillagua and neighboring districts."

Doctor Tamayo, Peru: "On the publication of manuscripts existing in the Museum of Madrid."

Doctor Aichel, Chile: "The influence of the Incas in Chile."

Six papers relating to the American race which were presented in other sections as follows:

Victor A. Belaude: "Excursions of the Incas into the Amazonian region."
José Toribio Medina, Chile: "The press in Guatemala from its beginning to 1821."
Alcée Fortier: "Some phases of the primitive history of Mexico and Central America."
J. C. Tello, Peru: "Did syphilis exist in old Peru?"
Francis E. Leupp, United States: "The treatment of the Indian tribes in the United States."
Rafael Uribe y Uribe, Colombia: "Indian territories."
Rodolfo Lenz, Chile: "On the Mapuche language."
Aureliano Oyarzun, Chile: "Artificial shell deposits of Melipilla and Cartagena."

It is apparent from a consideration of the long list of contributions that the study of the aboriginal tribes and their culture, ancient and recent, is receiving much attention in South America, although the work is in a large degree sporadic. With few exceptions investigations have been undertaken by individual students unsupported by government or by institutions of learning. Argentina alone has provided liberally for systematic research and the publication of results.

Individual enterprise, although worthy of the highest commendation, can not be expected to cover successfully so vast a field. Well organized and correlated explorations are required, and the responsibility lies at the door of the various national governments and of our great institutions of learning. One of the four great races of mankind is rapidly disappearing from the face of the continent, which but recently was wholly its own, and unless vigorous measures are taken it will have vanished along with its interesting culture, its languages, religions, social systems, and arts, without adequate record. The failure to preserve such a record for the benefit of history and science will be grievously lamented by future generations.

A resolution was passed by the section memorializing the Chilean Congress regarding the need of making adequate provision for the prosecution of investigations in American ethnology and archæology and for the upbuilding of museums.

The subsection of American history, prehistoric epoch, section 7, was merged into the section of anthropology and ethnology.

CONCLUSIONS.

Phonetic spelling.—The Pan-American Scientific Congress, in view of the great pedagogical advantages which would accrue from the adoption of a definite system of phonetic spelling which may be applied to all languages, recommends that an international phonetic conference be called in order that the best authorities in the matter of phonetics may attend as delegates from the various governments and establish by common accord a universal phonetic spelling.

Ethnological museums.—The Pan-American Scientific Congress agrees:

(1) To recommend to the governments of the American republics the desirability of building in each geographic zone, ethnological museums in order that the existing archæological material may be increased and that the investigations in this field be encouraged.

(2) To solicit from the governments of these republics the adoption of the resolution agreed upon by the scientific congress at Montevideo in which it is urged that the objects of ethnologic value found in old cemeteries, etc., be declared public property.

(3) To recommend to these governments to regulate the manner in which excavations may be made, so that they may be made only by persons with proper authority.

Study of anthropology.—The Pan-American Scientific Congress recommends the adoption of the following steps in order that the study of anthropology may be furthered:

(1) The founding of a chair of anthropology in the universities where such chair does not yet exist.

(2) Elementary studies of anthropology should be added to the study of natural sciences in secondary schools.

(3) An office of anthropological measurements should be established in every school, and the data obtained should be published periodically.

Appendix H.

Report on Section 3, Subsections 2 and 3; Zoology and Botany, by Mr. Thomas Barbour and Dr. Adolph Hempel.

REPORT BY DR. THOMAS BARBOUR.

The meetings of section 3 were rather disappointing, owing to the extremely heterogeneous mass of subject-matter which was presented. Three separate divisions should have been established, holding individual sessions, (1) biology, (2) ethnology and anthropology, (3) geology. The attendance was generally good, but, of course, embraced only a few persons interested in each of the several subjects. The discussion was often illuminating and not infrequently violent.

Twenty persons offered papers, but many were absent and in several cases no abstracts or notes of any sort were communicated. No one of the papers merited special attention, and in general in biology little original material was presented. Perhaps from this category it would be well to single out the notes of Doctor Lisson (of Peru), who would probably have presented a very interesting paper had he not been greatly handicapped by the constant hostility of the president for the day (Doctor Holmberg, of Argentina). Unfortunately Doctor Spegazinni (of Argentina) had but a short time to give a résumé of his widely known studies on a family of fungi which are insect parasites (the *Laboul beniaceæ*). Appended will be found a list of the titles in biology, with a short note stating how each was presented.

PAPERS PRESENTED.

Juan Bautista de Lacerda, Brazil: "Physiologic study of several toxic plants of Brazil. Study on the composition of the curare." (Absent; paper not read.)

Eugenio Antran, Argentine Republic: "Resultatsbotaniques des Commissions de limites Chileno-argentine, en 1903, sous les ordres du major Thomas Holdich." (Author absent; the work was exhibited to the section, but none of it was read.)

Barbose Rodriguez, Brazil: "Botanic, historic, and physiologic study on the curare." (Author absent; no abstract sent in for presentation.)

Carlos Bruch, Argentine Republic: "Metamorphosis and biology of Argentine coleopteræ. New and little known Longicorniæ." (No abstract.)

Luis Castillo, Chile: "Contribution to the biologic study of Chilean fish." (Author absent; no abstract.)

Amador Guajardo, Chile: "Useful plants in Chile." (Read in full.)

Angel Gallardo, Argentine Republic: "Bipolarity of the cellular division." (Author absent, but abstract read.)

Maduene D. Guituerrez, Peru: "Monograph on the Vicuna." (Monograph presented, but not read.)

Cristobal M. Hicken, Argentine Republic: "Catalogue of the Argentine polypodaceæ." (Abstract read by author.)

Carlos J. Lisson, Peru: See Doctor Woodworth's report.

Miguel Lillo, Argentine Republic: "Argentine enforbiaceæ." (Paper withdrawn.)

Carlos E. Porter, Chile: "(1) Studies on some Chilean antropodi, the Miriopodi, the Crustaceæ, and Alecrances; (2) The traqueæ of the Acanthinodera; (3) bibliography (Chilean) on anthropology and ethnology; (4) catalogue and bibliography of the Coecidi of Chile." (Nos. 1 and 3 were read in abstract and explained by the author, who was secretary of section.)

A. Raffray, Argentine Republic: "Pselapidæ of the Argentine Republic and description of new species." (Author absent; no abstract sent in.)

Carlos Reed, Argentine Republic: "Applied entomology in Chile. Applied ornithology. Lepidopteri of the gendre Thanatopsyche in Chile, and those of the gendre Osceticus in Mendoza, their relation to agriculture." (Author absent; no abstract sent in.)

Juan Jose Rodriguez L., Guatemala: "(1) Catalogue of the miriopidæ of Guatemala; (2) notes on the influence of the climate on plants and animals; (3) catalogue of the reptiles and Batraciæ in Guatemala; (4) brief notes and biologic observations; (5) catalogue of Mamiferi in Guatemala." (Author absent; no abstract sent in.)

REPORT BY DR. ADOLPH HEMPEL.

The following three papers were on the programme of this subsection:

Señor Tonnelier, Argentine Republic: "A contribution to the study of the means of combating the rust of wheat."

J. M. Huergo, Argentine Republic: "The *Diaspis pentagona* in the Argentine Republic."

Carlos E. Porter, Chile: "Entomologia agricola." (This latter paper, however, was not presented at any of the meetings of the section.)

The paper by Señor Tonnelier discussed the presence of wheat rust in the Argentine Republic, and also gave a general discussion of the methods employed in lessening the spread of this disease.

The paper by Señor J. M. Huergo on *Aulacaspis pentagona* was presented in printed form, and was practically a monograph of this species of Coccidæ. The author describes the female, male, and young, and discusses its distribution in the Argentine Republic. It is apparently spreading rapidly and is especially harmful to the peach trees, although it also occurs on many other plants. Natural parasites were also discussed and described.

Finally, the author describes the different methods of combating this insect and points out that the salt, lime, and sulphur wash and the hydrocyanic-gas treatment have given best results.

In this connection it is also interesting to note that the Argentine Government has offered a reward of 50,000 pesos to anyone who can present a method, practical, easy of application, and efficacious in exterminating this insect.

CONCLUSIONS.

Conservation of forests.—The Pan-American Scientific Congress expresses its desire that the American Governments enact laws prohibiting the destruction of forests and laws to regulate the planting of trees throughout their territories, and the congress also recommends that for this purpose the waters now lost in marshy grounds be utilized.

Medical flora.—The Pan-American Scientific Congress recommends the desirability of studying the medical flora of each country and of making a chemical analysis of the most important species, especially of those which possess toxic qualities.

Works of Ruiz and Pavon.—The Pan-American Scientific Congress recommends to the South American scientific institutions which devote themselves to the study of natural sciences the appointment of an executive committee to study the works of the great botanists Ruiz and Pavon. These works are deposited in the museums of Madrid. If they should be deemed worthy of publication, this committee should be empowered to proceed with such publication.

Cooperation of libraries.—The Pan-American Scientific Congress expresses its desire that all the libraries continue to publish complete catalogues, adding annual or monthly supplements when needed.

The Pan-American Scientific Congress recommends the establishment of a bureau of exchange and consultation among scientists, such a bureau to form an annex to the libraries in the capitals of the different countries of this continent. This bureau should be the means of encouraging the cooperation of scientists and would give a more practical and permanent character to the labors of the Pan-American Scientific Congress.

Adoption of these conclusions.—The Pan-American Scientific Congress expresses its desire that all the delegates and members of this congress endeavor to have the conclusions adopted put into practice in their respective countries. These endeavors are to be made independently of the direct negotiations between the various governments.

Appendix I.

Report on Section 3, Subsection 4: Geology and Related Subjects, by Dr. J. B. Woodworth.

More than two score papers of a geological, mineralogical, paleontological, or geographical character were presented to the section of natural sciences. These, together with others given in the sections of physics and engineering, are listed below. Several papers of an archaeological nature, in which the evidence of the antiquity of man on the continent of South America concerns geological formations, were also brought before the section, but these papers are not listed here. The time taken for the reading of papers in abstract and the discussions which ensued would seem to warrant in future meetings of the congress provision for a separate section for geology and cognate subjects.

The broad heading of general geology includes quite one-half of the papers read or presented by title. Of paleontology proper, there was 1 communication; mineralogy, 3; petrography, none; economic geology, 5; physical geography, 1; mineral waters, 1; bibliography, 1. While this numerical analysis has no value as an indication of the relative importance attached to these subjects in Latin-America, it may serve to enforce the attention of those concerned in the preparation of advanced students in these several subjects upon the fact that a vast and almost untouched field of research lies before the geomorphologist and petrographer in South America. Properly prepared graduates of colleges and universities seeking fields for fruitful research as a basis for doctorate theses might well seek problems in those South American states, where as yet no official organizations for the survey of the geological structure and mineralogical resources have been established. Such theses prepared with due consideration for the advancement of science in these countries and, where economic advantages arise from the investigations, made with the welfare of the state in mind could not but serve to strengthen the belief in the benefits to be derived from the cultivation of pure science.

The sole resolution of interest to geologists and paleontologists which was proposed concerned the publication of a Pan-American paleontology essentially on the plan of Paleontologia Universalis. In the discussion of this proposal the apparent impracticability and insufficiency of the measure were pointed out. Probably the object of the proposer could be partially accomplished if North American investigators should take pains to exchange more freely their publications in paleontology with fellow-workers in South American institutions. With this end in view, Boehm's Kalender für Geologen and Paleontologen should be consulted for names and addresses, and the Smithsonian Institution at Washington should be consulted concerning the franking of scientific printed matter to foreign countries.

PAPERS PRESENTED.

José Balto, Peru: 1. "Geologic bibliography of Peru." [a] 2. "Coal in Peru." [a]
Nicolas Besio Moreno, Argentine Republic: "The Argentine pamposia." [b]
Joaquim Costa da Senna, Brazil: "Mineral resources of the State of Minas Geraes." [a]
Florentino Ameghino, Argentine Republic: "Piric products of antropic origin in the neogene formations of the Argentine Republic." [b]
Orville A. Derby, United States: "Some points in the geology of Brazil." [b]
Christopher W. Hall, United States: 1. "Notes on the origin of the American Prairies." [b]
2. "The origin of the Minnesota iron ores." [b]
Enrique Herrera D., Argentine Republic: 1. "Meteoric iron in the Puerta de Arauco." [a]
2. "Mineral waters of the Argentine Republic." [a]
James F. Kemp, United States: "New geologic doctrines on subterranean waters." [a]
Professor Berklé, Costa Rica: "The phyto-geographic region of Costa Rica." [a]
Carlos J. Lisson, Peru: "Contribution to the knowledge of some ammonites of Peru." [a]
Codazi Viera, Columbia: 1. "Radioactive minerals of the Andes of Colombia." [a]
2. "Comparative studies of the regions of Muzo and Capaquira."

[a] Presented by title. [b] Read.

Miguel R. Machado, Chile: 1. "Earthquakes in Chile and study of the rocks near which the earthquakes are felt more intensely." 2. "Seismic rocks."
Miguel R. Machado, Chile: "Petroleum in Chile."
R. W. Raymond, United States: "Mineral wealth of America." [a]
F. Reichert, Argentine Republic: "Geographic-geologic notes on the high Andes."
Lorenzo Sundt, Chile: 1. "Origin of Chilean nitrate of soda and the salts that are found with it." 2. "Twelve geological profiles of the desert of Atacama."
Jay Backus Woodworth, United States: "The Shaler memorial expedition to Brazil." [b]

In other sections (engineering).

Francisco P. Moreno, Argentine Republic: "Data for the geological plan of the Province of Buenos Aires."
Carlos Velarde, Peru: "Notes on Peruvian mining."

Physics.

Sauza M. Gutierrez: "A point of view on earthquakes."
Miguel Machado: 1. "Earthquakes in Chile." 2. "Petroleum in Chile."

The following conclusion was adopted in this subsection: The Pan-American Scientific Congress expresses its desire that a committee be appointed to organize and direct the publication in several languages of the Pan-American paleontology. This publication will adopt the same general plan as the "Paleontologia Universalis."

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[a] Presented by title. [b] Read.

Appendix J.

Report on Section 4: Engineering, by Mr. H. D. Curtis.

The representation in the section of engineering was large and the sessions were marked by their practical businesslike character. By far the larger portion of the papers presented were studies by practical men, actually engaged at present in the carrying out of extensive engineering projects, the work of the section as a whole affording an excellent résumé of present engineering activity in South America. It is to be regretted that no engineer from the United States was present as a delegate, though this deficiency was in part made up by the willing cooperation of the American engineering societies in sending down a number of valuable papers by men of high rank in their respective fields of engineering science. In this section Argentina undoubtedly had the strongest representation, presenting, through engineers in private practice or through the representatives of the Argentine ministry of public works, some twenty papers.

While the papers presented cover many of the fields of engineering, hydraulic engineering and irrigation were especially emphasized, as this is naturally the department at present of most vital interest to the region of South America lying in the south temperate zone. Special mention should be made here of the papers presented by Señor Carlos Wauters, and the extended memoir on irrigation in the Argentine Republic (Vol. I) presented by Señor F. A. Soldano. Sanitary engineering was represented by several valuable papers, of which perhaps the most extensive were the two volumes dealing with the new sewerage system of the city of Santiago, now nearly completed, by Señores Alejandro Bertrand and Gerard van M. Broekman. This subject was discussed by Señor R. Salas Edwards.

A subject of great interest to Chile, the best methods of building in localities subject to earthquakes, was well handled in two papers by Señores E. P. Correa and Domingo Selva.

Reenforced concrete construction was represented by two papers, one by Señor F. Schilbash, of Argentina, and the other by Mr. William H. Burr, of the United States. The latter paper outlined the most approved modern methods of construction in reenforced concrete, and closed with an extended mathematical discussion of the strains existing in such compound beams, with general considerations as to their design and with special reference to economy in the construction of the retaining molds or forms.

Two papers by Señor Santiago Marin Vicuña and Mr. W. J. Wilgus were of considerable interest in their bearing on a possible future intercontinental railroad. Both of these papers dealt statistically with the percentages at present in use of the different railway gauges, calling attention to the great losses arising in countries without uniform gauge and the unification of gauge now practically universal in the United States, with a plea for cooperation and unification in the gauges, draw-bar height, etc., of South American roads, existing or projected, in order that it may be possible to unite in the future such scattered systems in great trunk or intercontinental systems.

Doubtless there is no one more competent to speak on the application of electricity to railroads than Mr. Frank J. Sprague, the inventor of the multiple-unit system. His valuable paper outlines the most approved modern practice and probable future development in the application of electricity to transportation. A history of this application prefaces the main portion of the paper, an historical record in which the author has played no small part.

Conclusions and resolutions were adopted as follows:

Conclusions and resolutions.

Irrigation.—The Fourth Scientific Congress (First Pan-American) recommends that the economical use of water be given special attention in the countries of America. For the purpose of executing systematic irrigation works and also to stimulate united

action on the part of those dependent on irrigation for the use of their lands, it is recommended that every effort be made to stimulate the spirit of solidarity in order that such irrigation works may be carried out.

Type of building in earthquake countries.—The Fourth Scientific Congress (First Pan-American) is impressed with the necessity of studying the type of buildings in those countries subject to earthquakes. Much can be done toward this end by making this the topic for a special international conference.

Hydraulic works.—The Fourth Scientific Congress (First Pan-American) recommends that amongst the topics to be discussed at the next scientific congress the following be included: The type of construction best adapted for piers and quays when the rivers along which such constructions are to be made are of great depth and swift current.

Preservation of native engineering terms.—The Fourth Scientific Congress (First Pan-American) recommends that in every one of the republics of America the engineering associations compile the native engineering terms and idioms with their Spanish equivalents and present such compilation at the next scientific congress.

Irrigation laws and systems.—The Fourth Scientific Congress (First Pan-American) recommends that at the next scientific congress the committee on organization submit a larger number of topics relating to irrigation; that the delegates to the next scientific congress submit the laws and regulations regarding the use of water in their countries; and that at the next scientific congress papers be presented relating to the irrigation systems in their countries, to those in course of construction, and under consideration.

Municipal water supply.—The Fourth Scientific Congress (First Pan-American) recommends that in view of the fundamental importance of adequate water supply for cities it is highly important that such public water-supply systems be established in the largest possible number of communities.

Pan-American Railroad.—The Fourth Scientific Congress (First Pan-American) recommends to the governments of the American republics the speedy completion of the Pan-American Railroad.

Appendix K.

Report on Section 5: Medical Science and Hygiene, by Col. W. C. Gorgas, U. S. Army.

The meetings of this section were attended by a large number of delegates from the various countries of America and a considerable number of Chilean physicians. A marked spirit of fellowship prevailed throughout the sessions of the section. A programme had been carefully prepared which arranged for the inspection of the hospitals and similar institutions in Santiago. On the occasion of such visits foreign physicians were requested to hold clinics and deliver lectures. The waterworks of the city were inspected and other investigations arranged to fit in with the regular sessions of the section.

Sanitation and sanitary precautions for the prevention of diseases were the questions of most distinct pan-American interest included in this section.

The following list of papers presented indicates the widespread interest in this group of topics:

Dr. Jesus Monjaras, Mexico: 1. "Present state of international prophylaxis in Mexico."
2. "Precautions against yellow fever in Mexico."

Dr. J. C. Perry, United States: "Methods for controlling plagues."

Dr. Juan Lacerda, Brazil: "Yellow fever."

Dr. W. C. Gorgas, United States: "The sanitation of the tropics in its relation to malaria and yellow fever."

The reading of these papers was followed by the adoption of the following resolution:

"The section of medical science and hygiene of the Fourth Scientific Congress recommends to the organizing committee of the Fifth Scientific Congress the adoption of a plan of study of international sanitary precautions, so that after its consideration at the next scientific congress a general plan of international sanitary measures may be adopted to make effective the rules on international sanitation mentioned in the convention of Washington of the 14th of October, 1905."

The epidemics to which the countries of America are subject were considered in a number of papers, of which the following may be mentioned:

Dr. M. J. Rosenau, United States: "Recent advances in the study of typhoid fever."

Dr. Mamerto Cadiz, Chile: "Serum and vaccination in Chile."

Dr. Jesus Monjaras, Mexico: "Campaign against the bubonic plague in Mexico."

Dr. Emilio Aldunate B., Chile: "Smallpox in Chile."

Dr. M. O. Tamayo, Peru: "The Uta in Peru."

Detailed consideration was also given to hospital organization and first aid to the injured. The more important papers submitted on these subjects were as follows:

Dr. Fernando R. Torres, Argentine Republic: "Free public medical service in the Argentine Republic."

Dr. Jose Grossi: "Medical service during earthquakes."

Dr. A. Vicencio, Chile: "Model hospitals."

Dr. Cecilia Gierson, Argentine Republic: "Necessity of popular instruction in first aid to the injured."

Dr. Eloisa Diaz, Chile: "Organization of medical inspection of public schools."

Some of the conclusions arrived at by the section are as follows:

In view of the enormous death rate caused by smallpox in Chile and other American countries, the Pan-American Scientific Congress recommends to the governments of America the speedy adoption of laws providing for obligatory vaccination.

Vital statistics.—The Pan-American Scientific Congress declares that in order to obtain accurate vital statistics it is necessary that each death certificate be signed by the family doctor, or in his absence by a public official, who shall establish the causes of death of the deceased.

Quarantine stations.—The Pan-American Scientific Congress believes that in order that the conditions of health of the population of port towns may be guaranteed, it is necessary to establish in such ports quarantine stations for all incoming vessels. If persons infected with contagious diseases be found on such vessels they should be obliged to enter a hospital placed under the proper medical direction.

Anquilostomasis.—The Pan-American Scientific Congress recommends to the governments of those countries where the *anquilostomasis* exists the study of special sanitary precautions to prevent it from spreading.

Social purity.—The Pan-American Scientific Congress recommends to the societies which endeaver to promote sanitary and moral betterment, the organization of public lectures on santitary precautions. It also recommends them to enter into a campaign against venereal diseases by distributing in large quantities all kinds of literature expounding to the public the unknown dangers of these diseases.

Dispensaries for venereal diseases.—The Pan-American Scientific Congress recommends the establishment of dispensaries for venereal diseases which will give free aid and medical assistance and medicines to the working classes. These dispensaries should be open at specified hours each day.

Hospital treatment for prostitutes.—The Pan-American Scientific Congress recommends the establishment of hospitals with liberal regulations where prostitutes with venereal diseases may secure treatment.

Free hospital service.—The Pan-American Scientific Congress recommends that all assistance given in cases of venereal diseases be given free.

School hygiene and inspection.—The Pan-American Scientific Congress declares to the Governments of this continent that it is absolutely necessary: (1) To organize the medical inspection of schools. (2) To declare the teaching of hygiene and of the dangers of alcoholism obligatory in the schools of primary and secondary instruction, public or private. (3) To provide food for the pupils during school hours. (4) To declare that one of the contagious diseases against which precautions have to be taken in school is tuberculosis, and in cases of symptoms the pupils should be obliged to enter a hospital and the infected rooms should be disinfected. (5) To establish sanatoria for tuberculous patients at the seaside and in the mountains.

Antituberculosis campaign.—The Pan-American Scientific Congress asks the cooperation of the public press against diseases through the publication of daily advertisements containing information as to the means best adapted to prevent the spread of tuberculosis and similar diseases.

The Pan-American Scientific Congress recommends the creation of antituberculosis leagues in those countries where such leagues have not as yet been organized.

Medical inspection of schools.—The Pan-American Scientific Congress recommends to the public authorities the organization of a complete medical inspection of schools, thus filling an important need of school hygiene. There should be at least one doctor for each 2,000 pupils.

Hygiene in cities.—The Pan-American Scientific Congress recommends that in the programme for the second Pan-American Scientific Congress there be included a discussion of the question of city hygiene, with special reference to its relation to street paving, taking into special consideration the climate, the facilities with which the proper material may be obtained in the different countries and the cost thereof.

Appendix L.

Report on Section 6: Juridical Sciences, by Dr. Paul S. Reinsch.

Under the arrangements made by the committee of organization, this section included only the discussions on private and civil law, together with penal law. The general branches of public law—international law, constitutional and administrative law—had been placed in the seventh section (social sciences). This classification does not imply that the South American professional jurists neglect the study of public law in its various branches, but it simply indicates that in the grouping of studies these subjects are classed with the political and social sciences. The section on jurisprudence dealt with certain subjects of private and penal law which are of interest to all the countries of America. Notwithstanding a rich and attractive programme, the sessions of the section were not largely attended. Few professional jurists had come from abroad, nor did the bar of Chile show a strong interest in the section. Nevertheless the papers read were of high merit, and in the interesting discussions many important points of American comparative jurisprudence were elucidated. A brief account will be given of the papers which were of special interest, and of the resolutions adopted by the section. The advisability of adopting resolutions on matters of a scientific character was discussed in the section. It was urged, on the one hand, that in a congress which had taken the entire field of American science for its province it was impossible to give to each proposition that detailed and careful consideration which ought to precede a vote by a scientific body. Moreover, the wisdom of voting at all upon questions of science was doubted by many. But as the regulations of the congress called for a statement of conclusions in each paper in the form of resolutions, the section in the course of its proceedings voted on matters upon which practical unanimity existed among those present. It was believed by some members that discussion would become merely perfunctory unless a vote were to be taken on the conclusions.

A paper was presented by Señor Manuel Ejidio Ballesteros, of Chile, on "Trust estates, their importance in legislation, and the advisability of maintaining them in law." Upon the basis of this paper and the discussion thereon the section voted to recommend that American countries under whose legislation perpetual trusts are still permissible should abolish this institution.

Señor Romualdo Silva Cortes, of Chile, read a paper on "Juristic persons," on the basis of which it was resolved to recommend that American countries should have legislation guaranteeing juristic personality, that such laws should be as uniform as possible, and that there should be positive laws recognizing juristic persons constituted in foreign countries.

Señor Candido Nogueira da Motta, of Brazil, read a paper on the treatment of juvenile offenders. His conclusions with respect to the management, housing, and education of such persons were approved. Señor Tomaso A. Ramirez, of Chile, read a paper on the classification of crimes with practical suggestions for the reform of criminal legislation.

A paper written by Mr. Roscoe Pound, of Northwestern University, on the "Unification of commercial law in America," was read by Mr. Paul S. Reinsch. The author, after dwelling upon the special difficulties which oppose themselves to the adoption of a uniform system in the United States, discusses the special character of commercial law, as resting upon interstate and international relations, and expresses his belief in the feasibility of a gradual approach toward uniform laws in many matters of commerce.

The discussions in the section showed that it is possible for representatives of North and of South American jurisprudence to find a common meeting ground in the consideration of juristic problems. The two great systems of American jurisprudence differ widely in method and in substance, but in a discussion into which both points of view enter, problems and principles receive a new setting, and illustrations from one system serve to elucidate difficulties in the other. This is especially true when problems of actual legislation are being considered.

PAPERS PRESENTED.

Alonso, Criado Matias, Uruguay: "Unification of legislation in countries using the same language."
Rada, Pedro J., Peru: "Unification of mercantile law."
Palma y V., José, Bolivia: "Principles of civil law."
Espina, Roberto, Chile: "Classification of punishments."
Silva Cortes, R., Chile: "Juridical personality."
Ballesteros, Manuel E., Chile: "Trusts and quit-rent estates."
Barberena, Rivas M., Nicaragua: "Liberty of testimony."
Pastrana, Mexico: "Liberty of testimony."
Vera, Robustiano, Chile: "Liberty of testimony."
Carvallo de Adherbal, Brazil: "The legal disabilities of married women with reference to property."
Ramirez, Pablo, Chile: "Matrimonial property in American countries."
Cisneros, Jeremias, Honduras: "Absolute divorce."
Ramirez, Thomas A., Chile: "Mental incapacity in civil law."
Martinez, Sobral E., Mexico: "Corporation law in Mexico."
Martinez, Marcial, Chile: "Res adjudicata. Effect of a judgment in a criminal case upon a question of civil law connected with the offense."
Manzanilla, José M., Peru: "The principle of revising judgments in criminal matters."
Duffoy, Luis, Argentine Republic: "Reform of penal law."
Cisneros, Jeremias, Honduras: "Capital punishment."
Ramirez, Thomas A., Chile: "Medico-legal study of crimes and misdemeanors."
Calderon, M. G., Mexico: "The nature of crime."
Pound, Roscoe, United States: "The unification of commercial law."
Martinez, Marcial, Chile: "On enforcing judgments pronounced by foreign tribunals."
Esteva, Roberto A., Mexico: "Property in coal and petrolum."
Mujica, Horacio, Chile: "Necessity of special saltpeter legislation."
Bañados, G. M., Chile: "Project of law concerning the merchant marine."
Okarte, Camacho V., Colombia: "Legal condition of aliens in Colombia."
Vidal, Victor, Chile: "Legal status of cooperative irrigation associations."

CONCLUSIONS.

Trust estates.—The Pan-American Scientific Congress believes:

(1) That perpetual trust estates are not founded on principles of justice nor are they in harmony with the economic principles which should guide legislative policy.

(2) That although they are considerably restricted in most modern legislations they still exist, and the bad effects of these institutions and the dangers they involve do not compensate for the services which they perform.

(3) That it is desirable that all those countries in which this institution exists should abolish the same.

Juristic personality.—The Pan-American Scientific Congress recommends that laws be enacted which recognize and guarantee juristic personality; that according to the needs of each country an effort be made to make uniform the legislation on this question, and that laws be enacted through which juristic entities created in one country be recognized in the others.

Marriage laws.—The Pan-American Scientific Congress expresses its desire that in the various faculties of law special attention be given to the modification that it would be desirable to introduce into the marriage laws of the American countries, having in view greater uniformity in this respect and the improvement of the legal status of married women.

The Pan-American Scientific Congress also desires that in making such a reform of the marriage laws the widow be given patria potestas over her legitimate children in those countries where this right is denied her.

The Pan-American Scientific Congress recommends that the jurists devoting themselves to a study of marriage laws present their conclusions at the next scientific congress.

Criminal legislation.—The Pan-American Scientific Congress believes that it is of the utmost importance to reform criminal legislation in matters relating to assault, in order that a scientific classification of these offenses may be adopted, which will establish a just and precise gradation of penalties in regard to the extent and nature of the injury caused and the grade of perversion of the offender, thus permitting of greater uniformity in the treatment of these cases.

Juvenile delinquents.—The Pan-American Scientific Congress believes:

(1) That it is necessary that the State should concern itself with the reform of juvenile delinquents and morally abandoned children.

(2) This intervention must not be exclusive. The associations founded for this purpose should lend their assistance to the State. For this service they should receive subsidies. Care should be taken, however, that the institutions established for the care of juvenile delinquents should not unduly exploit the labor of those under their charge.

(3) In order that these institutions may be successful in their work it is absolutely necessary that neither the name of penitentiary nor prison be given them.

(4) The number of juvenile delinquents to be kept in each of these institutions should never exceed 200.

(5) One of the conditions for success in the work of these institutions is unity of plan and direction. It is desirable that in each institution there be established various categories, carefully graded, according to the nature, temperament, tendencies, and age of the minors.

(6) The direction of these institutions must be turned over to scientifically trained men irrespective of political considerations.

Private international law.—The scientific congress expresses its desire that the American governments agree to and sign conventions dealing with questions of private international law.

Maritime legislation.—The scientific congress expresses its desire that the governments of America negotiate treaties providing for greater uniformity in maritime legislation.

Medical jurisprudence.—The scientific congress believes that obligatory study of medical jurisprudence should be established in the law schools of American universities.

Appendix M.

Report on Section 7—Social Sciences.

SUBSECTION RELATING TO HISTORY, BY MR. HIRAM BINGHAM.

As was to be expected in a scientific congress the consideration of purely historical topics did not occupy much time. Political science, jurisprudence, and international law proved to be of more interest to the delegates, and the discussions which arose over some of the political and legal questions were much more lively and interesting than they are ordinarily at the annual meetings of the American learned societies. The programme contained a fair number of historical papers, but owing to the absence of the authors, the pressure of time, and other reasons, only a very few were read and they only in part.

The following papers were listed for the first two days devoted to "Historia."

(1) "Picture of the colonial era: Life and customs; resemblances and differences between colonial and European civilization," by Benedicto Octavio.

(2) "A few reasons why the English colonies, on achieving their independence, became a single nation, while the Latin-American colonies did not form a federation or even a confederation," by Hiram Bingham.

(3) "Tendencies toward federalism and 'unitarism' in Latin America; their causes and effects," by Esteban Guardiola.

(4) "The expeditions of the Incas into the Amazon regions," by Victor Belande.

(5) "Peruvian numismatics," by José A. Izcue.

(6) "Geographical bibliography of Peru," by José Toribio Polo.

(7) "Diplomatic history of Central America," by Edouard Poirier.

(8) "Chile in 1908," by Edouard Poirier.

Of these the second paper was the only one read; the others will doubtless appear in the publications of the congress.

The programme for the second day commenced with Professor Moses's paper on "The foundations of English and Spanish colonial civilization in America." It was read on the first day and was received with much interest and applause. One of the delegates, in moving a vote of thanks to Professor Moses, spoke of his paper as "one of the most useful works presented by this congress."

Other papers read on the second day were "The initiation and commencement of the South American war of independence," by Luis Arce, published in pamphlet form and distributed; "The historical literature of Chile," by Luis Galdames; and "The work of the historians of the United States," by Professor Sloane, of Columbia University. Señor Galdames's paper had particular reference to life in the colonial era of Chilean history.

Among the papers read in other sections that were of interest to students of history may be mentioned the following, all of which will be printed in full in the report of the congress:

"An historical picture of the intellectual production of Chile," by Jorje Huneus Gana.

"Critical history of taxation in Chile," by Luis Navarrete.

"The evolution of the principle of arbitration in America," by J. F. Urrutia, Colombian Minister of Foreign Affairs.

"The most-favored-nation clause in American commercial treaties," by Julio Philippi, of Chile. Señor Philippi's paper contained a concise résumé of the history of Chilean foreign commercial policy.

Dr. Ernesto Frias, of Uruguay, read selections from his forthcoming work on "Commercial treaties," which should prove of value to students of diplomatic history.

During the congress there came from the press a new and important work in two volumes on Sebastian Cabot by that prolific writer and bibliographer, José Toribio Medina. Señor Medina reported himself as now at work on the fourth volume of his "Imprenta en Méjico," the third volume of which appeared a day or two before the opening of the congress.

Mention should also be made of the loss to Chile, by the death on January 4 of Don Pedro Pablo Figueroa, one of her most distinguished historians. The author of numerous historical and biographical works, he will probably be longest remembered for his "Diccionario Biográfico Americano" and "Album Militar."

SUBSECTION RELATING TO INTERNATIONAL LAW, BY DR. L. S. ROWE.

Of all the questions discussed in the section on social sciences, the most important, as well as the most fruitful, were those relating to international law. This was due in large part to the far-reaching significance of a paper submitted by the Hon. Alejandro Alvarez, solicitor of the Chilean state department. In this paper Doctor Alvarez undertook to analyze the distinctively American problems in international law. He was careful to point out that his thesis did not involve the development of a system of international law in any sense antagonistic to the accepted doctrines. Owing to the geographical position, the conditions of settlement, the special racial problems, and the peculiar economic development of the Republics of the American Continent, a series of problems have arisen distinctively American in character, and requiring special principles of international law for their solution. Furthermore, the possibility of agreement between the Republics of America on principles representing an advance in international law places them in a position to make important contributions to the subject. These principles when once agreed upon gradually receive the acceptance of other nations, and thus become world-wide in character.

The conclusion submitted by Doctor Alvarez was as follows:

The First Pan-American Scientific Congress recognizes that the diversity in the development of the New World, as compared with the Old, has had the following effect upon international relations, namely, that there have been and are general problems and conditions in Europe which have no application to the American continent; that the American continent are confronted by problems sui generis or distinctively American; and that the states of the American continent have dealt with subjects in the Pan-American conferences which are of interest only to those states or which, if of universal interest, have not yet been susceptible of universal agreement.

This class of questions constitutes what may be termed "American problems in international law."

The First Pan-American Scientific Congress recommends to all American states to have the members of their faculties of jurisprudence and social science give attention to the study of "American international law."

This conclusion gave rise to prolonged discussion.

An important contribution to this discussion was made by one of the Brazilian delegates, the Honorable Senhor Sa Vianna. Doctor Sa Vianna, in discussing the existence of American international law, submitted the following views:

"To consider the peculiar conditions of the states of the New World does not of itself establish the existence of an American international law, save when that law shall regulate relations exclusively between and restricted to the several American states, because the very nature and functions of this branch of international law are opposed to that theory."

In order to reconcile the opposing views a special committee was appointed. This committee agreed upon the following formulation which was submitted to the section at the session of the 31st of December and unanimously adopted:

"The First Pan-American Scientific Congress recognizes that the diversity in the development of the New World as compared with the Old has had the following effect upon international relations, namely, that on this continent there are problems sui generis or of a distinctively American character and that the states of this hemisphere, by means of agreements more or less general, have regulated matters which are of sole concern to them, or which, if of universal interest, have not yet been susceptible of universal agreement, thus incorporating in international law principles of American origin."

This class of questions constitutes what may be termed "American problems or situations in international law."

The scientific congress recommends to all the states of the American Continent that the faculties of jurisprudence and social science give attention to the study of these matters.

Another paper of great interest and importance was submitted by the Hon. Marcial Martinez de Ferrari, a delegate of Chile. This paper dealt with the results of The Hague conferences. The conclusions of this paper were as follows:

The Pan-American Scientific Congress makes the following declaration—

The progress of international law depends, in the main, on the agreement by a group of nations on principles which signify an actual advance in international law.

It is a matter of world-wide interest that the American countries agree on principles that represent an actual advance in their international relations, and which may later on be accepted by conferences of a world-wide character and especially by The Hague Conference.

SUBSECTION RELATING TO REPRESENTATIVE GOVERNMENT, PARLIAMENTARY GOVERNMENT, CENTRALIZATION, AND DECENTRALIZATION, BY DR. L. S. ROWE.

One of the most suggestive papers presented to this section was that of the dean of the faculty of philosophy and letters of the University of Buenos Aires, Dr. José Nicolás Matienzo on "Experimental politics." The conclusion of this paper was embodied in the following resolution, which was unanimously adopted: "The Pan-American Scientific Congress recommends to the Universities of the American Republics the comparative study of the actual operation of their political institutions with those of foreign nations, with a view to ascertaining the conditions and laws under which republican institutions develop." This resolution gave rise to considerable discussion, in which a large number of delegates took part.

Another paper which was looked forward to with much interest, because of its timeliness, was "The operation of parliamentary government in Chile," by Dr. José A. Alfonso. In this paper Doctor Alfonso analyzed the difficulties with which parliamentary government in Chile had to contend, and arrived at the following conclusions:

(1) The limitation of the suffrage is, under present political conditions, impracticable.

(2) Representation should be national rather than sectional. Representatives should give preference to those questions which are of national importance, without being influenced by the narrow interests of smaller groups.

(3) If we are to have representatives of the whole nation, the whole nation should elect them, or if this is not possible they should be elected by large electoral divisions. In Chile these might be three in number; the northern, the central, and the southern districts.

(4) The representatives thus elected would in all probability be in a position to act in the interest of the whole nation.

(5) The evils of the present method of congressional elections in Chile are due to the small electoral divisions.

Another paper which aroused great interest was that of Prof. Hiram Bingham, the title of which was "Some reasons why English colonies, after emancipation from the mother country, formed a single state, whereas the Latin-American colonies were not able to form a federation, or even a confederation." The conclusions reached by Professor Bingham were as follows:

(1) The tendencies of colonists depend on the history of their race in the centuries preceding their emigration. Their actions are influenced by the experiences of their ancestors. The motives of their conduct may be traced to the history of the fatherland.

(*a*) The history of England in the five hundred years preceding the colonization of the Atlantic seaboard of North America is the story of a united nation governed by a single executive. Her sons fought as Englishmen and for England. Hence the English colonists carried to America with them the racial habit of living under a unified, centralized government.

(*b*) On the other hand, the history of the Hispanic Peninsula during the five hundred years preceding the colonization of Latin America is the story of a score or more of independent kingdoms and cities. Men fought as Castilians or Aragonese and not as Spaniards. There was no such thing as a political entity called Spain. The unification of Spain, begun by Ferdinand and Isabella, was contemporary with the colonization of America and did not affect the racial habit of the colonists. They carried to America with them a tendency to build up strong local governments.

(2) The success of any important political action depends largely on historical preparation for such action.

(*a*) The movement toward a federation in the English colonies was slow and steady, extending over a period of one hundred and fifty years.

(*b*) The English colonists were allowed free intercolonial intercourse, while the Spanish colonies were forbidden to travel and trade from one colony to another.

(*c*) The English colonial wars against French and Indians brought about a strong sentiment of intercolonial dependence and neighborly acquaintance among the English colonists.

(3) Geographical conditions are of the very greatest importance in determining the course of history.

(*a*) The English colonists were placed by fate close together on a narrow strip of seacoast, less in length than the seaboard of Chile, with very few physical obstacles to their intercourse.

(*b*) The Latin-American colonists, on the other hand, were scattered over an enormous area and separated from each other by gigantic geographical obstacles. Moun-

tains and deserts, jungles and swamps combined to isolate the Hispanic colonists and to prevent the upbuilding of a community of interest and an intelligent acquaintance with one another.

(4) Conclusion: The English colonists, with radical tendencies toward union, enjoyed a political and geographical freedom which enabled them to unite. The Latin-American colonists, with racial tendency toward independent local government, were surrounded by political and geographical conditions which made the formation of a federation impossible.

Two papers were submitted to this section by Dr. L. S. Rowe, one on "Public opinion in American democracies," and the other on "The influence of city environment on popular thought and action."

SUBSECTION RELATING TO DIPLOMATIC HISTORY AND INTERNATIONAL POLICY, BY DR. ARCHIBALD CARY COOLIDGE.

Although these subjects were among those open to the discussion of the congress, very little was said about them. International law was much talked about, but "policy," as apart from law, was seldom touched upon. We may suppose that the chief reason for this was the fear of unintentionally wounding the susceptibilities of any of the delegates and the desire to keep clear of politics in a scientific congress whose members represented countries some of which have delicate political questions with their neighbors. The one purely political paper was that of Prof. Archibald Cary Coolidge, of Harvard University, "America in the Pacific," and this took care to raise no questions on which the interests of the different American Republics might be divergent.

CONCLUSIONS.

In addition to the conclusions adopted in the section of social science and mentioned in the foregoing sectional reports may be mentioned the following:

Administrative law.—The Pan-American Scientific Congress recognizes the importance of mutual help in the administrative action of the governments and institutions of the American Continent.

In order that these relations may be developed, we recommend vigorous cooperation in the work which is being done by the International Union of American Republics, the office of which is established in Washington, as well as in the work of the Pan-American Commissions recently created in the several countries of this continent.

Pan-American Peace Association.—The Pan-American Scientific Congress realizes the importance of a "Pan-American Peace Association," and recommends that it be founded in the countries where it is not as yet established.

Public opinion in America.—The Pan-American Scientific Congress believes that Doctor Rowe's paper on "Public opinion in the democracies of America" will greatly contribute to the education of public opinion in the American Republics, and recommends that it be printed and widely circulated on this continent.

Appendix N.

Report on Section 8: Sciences of Pedagogy and Philosophy, by Dr. W. R. Shepherd; and Subsection 17: Fine Arts, by Mr. W. H. Holmes.

REPORT BY DR. WILLIAM R. SHEPHERD.

The sessions of this section of the Pan-American Scientific Congress were inaugurated on Saturday, December 26, 1908, with the election of a permanent presiding board composed as follows: Chairman, Manuel Vicente Ballivian, Bolivia; vice-chairman, Melchor Lasso de la Vega, Panama; secretaries, William R. Shepherd, United States, and Enrique Molina, Chile. Among the professional educators who constituted the majority of the large audiences in attendance, many were women who took an active part in the proceedings.

Of the 150 papers presented practically all dealt with some phase of education. Two or three treatises on philosophical subjects were submitted, but none was read even by title—a circumstance that seems to indicate the desirability in future pan-American scientific congresses of assigning to philosophy, as such, an independent place on the general programme. Owing to lack of time, less than one-third of the papers were read, in whole or in part. Though covering fairly well the entire field of education they showed a marked tendency toward a concentration of attention on such particular points as the general purposes of education, the education of women, the teaching of modern languages, the value of æsthetic culture, and the essential characteristics of primary instruction.

None of the statements given of the arguments advanced or of the conclusions reached in the several papers read contained much that was novel or original—at least in the country of the author concerned—but the estimate of their worth can not be determined by this standard alone. The real value, both of the treatises themselves and of the discussions that followed, consisted rather in the qualities of interest and helpfulness which they developed. In most cases the tone of the treatment accorded was broad and unpartisan. Local concerns, of course, received a large amount of attention, and occasionally the contrasts drawn between the educational interests of one republic and those of another, or between one institution and another in any particular state, caused the trend of discussion to become somewhat narrow. Nevertheless, a general desire prevailed throughout the sessions to have such questions examined in the light of the benefits that might accrue from the experience of other nations, and from the discussion of themes possessing a deeper educational significance.

The list of conclusions given will afford some idea of what were regarded as the most important principles that could be derived from the several papers presented. None of them provoked so much serious discussion or afforded so much enlightenment to the American interested in the study of present conditions in Latin-American republics as the treatises dealing with the education of women and with the problem of what ought to constitute the basis of a general education. The former revealed the evidence of a desire on the part of women in the countries of Latin America to engage more actively in the affairs of life; whereas the latter emphasized the necessity of giving to education a more distinctively secular character. As an expression of the desire in question, it was urged that the education of woman ought not to be limited to a mere preparation for the assumption of the duties of wife and mother, but should be broadened sufficiently to enable her to support herself, should the exigency arise, and to fulfill her social mission as a citizen of the state on a freer and more ample scale.

Accordingly when the question was put, whether the education of a girl should be special in its character or should be in general similar to that given to a boy, most of the men voted in favor of the former proposition, and practically all of the women present in favor of the latter. So marked was the division of the sexes on this point, and so manifest the absurdity of allowing a division of the sort to appear in the proceedings of a scientific congress, that the section eventually took the radical step of resolving to refrain from voting any conclusions whatever. Instead, it resolved to

confer this power upon the presiding board alone, under the stipulation that the conclusions which that body might deem suitable for submission to the approval of the Congress in general session, should be such as possessed a Pan-American bearing. Availing itself of the discretionary authority thus granted, the presiding board decided to omit so controversial a question as the proper education of woman from the list of conclusions to be presented.

In the treatment and discussion of the problem of what ought to constitute the basis of a general education the point in dispute turned upon the truth or falsity of a statement to the effect that the development of individuality in the pupil required that dogmatic teaching of every sort should be excluded from the course of instruction. On the ground that the statement was intended as an attack upon the church a futile effort was made to prevent the paper in which it was contained from being read. Thereupon the defenders of the negative side of the argument declared that in the United States, the country which their opponents chose to regard as the classical land of religious freedom, the dogmatic teaching of Protestantism was practically universal in its public schools. Failing in turn to establish the truth of this assertion, they proposed the voting of a series of conclusions, the most significant of which maintained "that the basis and foundation of moral education is religious instruction, since it fixes a superior authority endowed with all of the elements needful to bind the human conscience." The presiding board, however, following the precedent already observed, did not deem it advisable to adopt any conclusions on this particular phase of education.

CONCLUSIONS PRESENTED IN THE SUBSECTION "AMERICAN UNIVERSITIES," ADOPTED BY THE SECTION OF SOCIAL SCIENCES.

(1) That, while giving due regard to the preparation of students for professional careers, the universities of America should provide for the training and the education of scientists, developing in them the civic spirit and the idea of cooperating in the solution of the problems of the American continent.

(2) That the courses of study offered should lay stress upon such facts, subjects, or problems as relate more especially to the political, economic, and social development of the American nations.

(3) That autonomy, alike administrative, disciplinary, and educational, ought to be the basis of organization of the universities of America.

(4) That an international bureau of American universities be organized for the purpose of facilitating communication among them and of collecting and exchanging their publications.

(5) That the American universities enlarge as much as possible the American section in their respective libraries, and supply it with catalogues and inventories procured as a gift or in exchange through the medium of the diplomatic service or by such other means as they may consider effective.

(6) That arrangements be promoted whereby copies of documents may be readily obtained and whereby the originals themselves may be consulted through the medium of an international loan agency organized under the direction of the diplomatic service.

CONCLUSIONS ADOPTED BY THE SECTION OF PEDAGOGICAL SCIENCES AND PHILOSOPHY.

(1) That the conclusion adopted by the Third Latin American Scientific Congress, "declaring the necessity for the immediate organization of a Pedagogical League" be carried into effect by founding national educational associations in all of the sister Republics, and by establishing a Pan-American Educational Association composed of such of their respective educators as may assemble in each of the Pan-American Scientific Congresses, the chief function of whom shall be to study the adaptation of educational principles to the American social medium, and to secure the interchange and cooperation of their educators.

(2) Recommending to the educators of America the study of the declaration of principles put forth by national educational associations in the countries where these have have been founded, so far as such principles may be suited to the special needs of each of the sister Republics, the general object being to secure Pan-American confraternity by means of the community of educational ideals.

(3) That, in accordance with the resolution of the Third Pan-American Conference the several Governments be requested to provide for the creation in the International Bureau of the American Republics of a Pan-American department of education, which shall be charged with the duty of publishing in English, Spanish, and Portuguese all treatises and works on education which may possess a Pan-American interest, and of subserving all other educational interests in America.

(4) That the problems inherent in the conditions that form the American social medium may be solved by an education that will develop the three potentialities of man—namely, the head, the heart, and the hand—in such a manner as to transform them into the three vital forces known as intelligence, morality, and skill, by the application of which our children may be prepared for an active and useful life.

(5) That the study of Spanish, Portuguese, German, and French be encouraged in the countries of America where English is spoken; of English, Portuguese, French, and German where Spanish is spoken; of Spanish, English, French, and German where Portuguese is spoken.

(6) That æsthetic education is quite as important as intellectual and moral education, and hence should receive an equal amount of attention in the course of instruction.

(7) (*a*) That a part of the course in history given in secondary schools should be devoted to special consideration of the works of the most important classical writers, artists, and philosophers.

(*b*) That a methodical study of Greek and Latin roots should form part of the course in Spanish, so as to facilitate an acquaintance with the technical terms of science.

(8) That the several countries represented in the Pan-American Scientific Congress adopt a method of determining proficiency in school work which shall be more in harmony with modern principles of hygiene and pedagogy.

(9) (*a*) That a gymnastic system ought to be established in every country, based upon scientific principles of physical education, and yet adapted strictly to the climate and to the temperament and character of the individual.

(*b*) That physical education should occupy a very important place in the school curriculum, and should be made obligatory from the primary school to the university.

(*c*) That in the school schedule one afternoon a week should be set aside for games, walks, and excursions, special attention being given at the time to the teaching of marksmanship.

(10) That it would be desirable for the several countries to recognize the certificates of qualification granted by foreign States to primary and secondary school teachers in accordance with the following conditions:

(*a*) That the plans of study and the programmes of instruction cover the same ground, or furnish at least the minimum of qualifications required, so that the teaching done may be satisfactory to the State concerned.

(*b*) That the teachers in question be not incapacitated from performing their duties on account of any infraction of the laws, criminal or otherwise.

(*c*) That such recognition be effected on a reciprocal basis between the countries concerned, and be subject also to a prior certification of the authenticity of the qualifications alleged to be possessed by the teacher.

(11) (*a*) That the inductive sciences should form the basis or organic center of a general education such as will afford a complete sytem of philosophy for the individual.

(*b*) That this system of philosophy should be scientific in its fundamental concepts, and melioristic in its aspirations.

(*c*) That the teaching of morality should be given a historical and social basis, and that the ideas of solidarity and of human cooperation should be its generating principles.

PAPERS PRESENTED.

José Ramon Vargas, Chile; Alejandro Venegas, Chile; Teresa Prats de Sarratea, Chile; Melchor Lasso de la Vega, Panama: "Is the concept of happiness, and therefore the object of public instruction, presented in the same way in the European and American nations? What should be the ideals and the dominant purposes of education and instruction in the latter? The adaptation of teaching to the American social medium."

Vicente Delgado, Peru; Moises Vargas, Chile: "Bases of an international Pan-American bureau of information and publications on public instruction which shall provide also for the preparation of uniform and complete educational statistics."

Moises Vargas, Chile: "How should the cost of education be met? Conditions under which the State may contribute to the support of private educational institutions."

E. Garcia E., Peru; Adela A. de Altamirano, Chile; Teresa Prats de Sarratea, Chile; William Francis Rice, United States: "Tendencies in the education of woman befitting the social mission that she has to perform in America."

J. Chavez, Chile; Patrick J. Kenny, Chile; Luis Caviedes, Chile; German Peters, Chile; José Ramon Vargas, Chile: "Foreign languages that should be studied in America."

Tomas Guevara, Chile; Arturo Pardo Correa, Chile: "To what extent may classical culture be employed advantageously in American education."

Elias Leiva, Costa Rica; Margarita Saa, Chile; Luis Caviedes, Chile: "What is the best method of determining proficiency in educational work."

Teodoro Jahn, Brazil; Elvira Lopez, Argentine Republic; Romulo J. Pena, Chile; Abraham Valenzuela, Chile; José A. Campos, Chile; Ernesto Courtois Bonencontre, Chile; Teresa Prats de Sarratea, Chile; Brigida Walker, Chile: "The importance of æsthetic culture in the general education of children."

Leotardo Matus, Chile: "Physical culture in primary, secondary, and normal schools, and in institutions of higher education."

Guillermina von K. de Froemel, Chile; Juan A. Lopez, Chile: "School architecture."

Joaquin Cabezas, Chile; Ester Hurtado, Chile: "After-school activities; means of coordinating their forces, and achieving their educational purposes as fully as possible in the threefold sense of instruction (by means of lectures, complete courses, physical education, etc.) amusement, (sports, excursions, school entertainments, etc.), and solidarity (cooperation, mutual aid, study and instrument boxes, etc.)."

William R. Shepherd, United States: "The adaptation of teaching to the American social medium."

Luis Echeverria Cazotte, Chile: "The desirability of providing for the development of primary education by the use of funds especially devoted to this purpose."

Dario E. Salas, Chile: "What subjects should be included under the head of primary education in America. To what extent may the primary education of both sexes be differentiated?"

Rafael Diaz Lira, Chile; Dario E. Salas, Chile: "Conditions under which it might be desirable to recognize the certificates of qualification granted to primary and secondary school teachers among the various nations of America."

Nicetas Krziwan, Chile; Romulo J. Pena, Chile; Eduardo Castro, Chile; Demetrio Concha, Chile; Eduardo Lamas, Chile: "The practical tendency that primary instruction might have without detriment to the general objects at which it aims."

Dario E. Salas, Chile; Arturo Pardo Correa, Chile: "The correlation of primary and secondary education."

Maria F. MacDougall, Chile: "How should the primary schools in the American Republics be organized so as to contribute to the complete assimilation of the descendants of foreigners into the national life?"

Leopoldina M. de Trupp, Chile; Manuel Retamal Balboa, Chile: "The importance of the kindergarten."

Enrique Molina, Chile: "What classes of studies should constitute the fundamental basis or organic center of secondary education in the several communities of America?"

Luis Vargas Salcedo, Chile: "Ideas that should prevail in the organization of a medical service for schools."

Luis Flores Fernandez, Chile; Manual J. Soto, Chile: "Organization of the instruction of abnormal children."

Caroline Burson, United States and Chile: "The desirability of devoting a part of the time assigned by the schedule to each branch in the later years of secondary instruction to the performance of individual work on the part of the pupil in libraries and laboratories, and thus render his own cooperation in his education more intense."

Inez Ewing Brown, United States and Chile; Julio Chavez, Chile; Benjamin Jimenez, Chile; Dario Castro, Chile; Luis Caviedes, Chile; Gutemberg Lagos, Chile: "The necessity of teaching modern languages in such a manner that, while proficiency in speaking them is being attained, the pupil may be rendered capable of using foreign literature for professional purposes."

Victor R. Celis, Chile; Guillermo Gonzalez, Chile; Agustin Cannobbio, Chile: "The desirability of replacing, in part at least, the use of anthologies by the reading in extenso of select classical works."

Luis Flores Fernandez, Chile: "The educational value of manual training in secondary schools."

Dario E. Salas, Chile; Arturo del Solar, Chile: "The organization of vacation courses for the purpose of modernizing the knowledge acquired in universities and normal schools."

Francisco Araya Bennett, Chile; Luis Galdames, Chile: "The desirability of introducing commercial education into the primary, secondary, and higher grades, to meet the various requirements of business. The necessity, also, of maintaining supplementary courses for persons actually engaged in business."

Francisco Araya Bennett, Chile: "In what form should commercial instruction be carried on in professional schools for girls?"

Aurelio Rubio and Manuel Soto Vivanco, Chile: "Improvement schools for workmen."
Lina Mollet, Chile: "Ambidexterity in education."
Luis Echeverria Cazotte and Carlos D. Girola, Chile: "Degrees suitable for agricultural education on the American Continent."
Daniel Martner, Chile: "The training of teachers for agricultural and special instruction."
Dora Keen, United States: "Trained nurses in the medical inspection of schools."
Clemente L. Beltran, Mexico: "The intuitive process; its pedagogical classification; its scientific bases; when and how it should be employed; its history and its double aspect; its appearance in Mexico."
Inez Ewing Brown, United States and Chile: "The desirability of adapting the courses in foreign languages according to the practical application that each may have, in certain cases confining the course to translation, in others offering separate courses in translation or conversation, and adhering to the common practice of including both in a single course in those cases only where utility may render it advisable."
Francisco Figueroa, Mexico: "Phonetics as the basis of modern methods for the teaching of reading, writing, and the need of spelling reform."
Dora Keen, United States: "The desirability of granting subventions to mothers dependent upon their children for support, thus enabling the latter to continue their school work."
Eleuterio Flores, Chile: "The organization of instruction in typewriting."
Samuel Garcia, Mexico: "Abstraction and analysis in logical processes."
Lina Mollet, Chile; Julio Ouel, Chile: "The practical application of drawing in professional schools for girls."
Porfirio Parra, Mexico: "The distribution of logical matter."
José E. Pedroza, Mexico: "International education; the desirability of establishing it."
Mariano Poncela, Mexico: "Education of the Indians in Spanish-American countries. Should history be studied in primary schools?"
Tomas Rios Gonzalez, Chile: "Psychological notes on science and religion."
Domingo Villalobos, Chile: "Vacation school colonies."
Victor Mancilla, Chile: "Variety in the composition and use of the text-book in teaching. Remarks on certain tendencies, old and new, in the teaching of the mother tongue. Education as based upon the parallelism between the evolution of the individual and that of the species."
José Ramon Vargas, Chile: "The causes of illiteracy in adults, and the means of avoiding it."
Luis Vargas Salcedo, Chile: "The school of Frau Geanne van Oldenvarnevelt;" and, "We do not know how to breathe; the necessity for training the organs of respiration."
Emeterio Vargas Barrera, Chile: "A general study of the deaf and dumb."
Maria Solis Muñoz, Mexico: "The school schedule."
Claro P. Dassen, Argentine Republic: "Notes on Esperanto as the auxiliary international language."
Estanislao Fraga, Chile: "The need of adopting an international language as a means for the diffusion of scientific knowledge."
Victor Domingo Silva E., Chile: "A critical essay on the teaching of the mother tongue."
Luis Arce Lacaze, Chile: "Defects surviving in the educational systems of to-day and measures that might be proposed for their removal."
Carlos Veas Salazar, Chile: "Ideographic writing."
Luis Galdames, Chile: "Should the professional teaching of business be carried on without reference to that general knowledge which forms the basis of culture, which admits of a degree of intellectual maturity, and which renders learning more efficacious? Or should the programme rest solely upon what that teaching may itself afford?"
Rafael Acuña, Chile: "The library in the normal school."
Juan de Dios Aguilera, Chile: "Subjection in the school, and the education of woman."
Juan Ramon Andrade M., Chile: "The general education of children."
Aurora Argomedo, Chile: "How should the women of America be educated so as properly to fulfill their destiny?"
Leonidas Banderas Le Brun, Bolivia: "A new French reader for the practical teaching of languages, and methodological notes on the teaching of foreign languages."
Antonio Borques Solar, Chile: "Song book of the archipelago."

Jorje Brañes, Chile; Rafaela Casas Cordero, Chile: "The formation of collections of pictures, maps, and other school material for the teaching of history, geography, and other branches."
Roberto Brenes Mesén, Costa Rica: "The school of to-day."
Pedro P. Canales, Chile: "Libraries of secondary education."
Dario Castro, Chile: "Spanish semasiology."
Eduardo Castro, Chile: "Moral education."
Claudio Chamorro, Chile: "Industrial schools in Chile."
Eloisa Diaz, Chile: "School canteens, and the organization of an agency for destitute children."
Ismael Larrain Mancheño, Chile: "The organization of an agency for destitute children."
Ines Echeverria de Larrain, Chile: "The importance of higher education in art in the institutions of public instruction."
Macario Escobari, Bolivia: "The mechanical primer."
Arturo Fernandez Pradel, Chile: "The necessity and importance of evening schools for workmen."
Eleodoro Flores, Chile: "Select rules and Chilean orthography."
Otto Krause, Argentine Republic: "Industrial education in the Argentine Republic."
Baudilio Lagos, Chile: "The teaching staff in secondary education, and tendencies in the education of woman befitting the social mission that she has to perform in America."
Fabian Lobos, Chile: "Lessons in penmanship according to the English method; short lessons in penmanship according to the upright or hygienic method; and what a skilled caligraphic report ought to contain."
Victor Mansilla, Chile: "New education. The teaching of the mother tongue according to the new tendencies, and the composition and use of the text-book of the future."
The ministries of public instruction of Bolivia, Colombia, Ecuador, Peru: "Data in reference to public instruction."
Gaspar Moll, Chile: "How drawing should be taught in secondary schools."
Arturo Pardo Correa, Chile: "How the cost of education should be met."
Teresa Prats de Sarratea, Chile: "Schools of domestic art and science."
Alfredo Ramos Montero, Uruguay: "Agricultural education in the normal schools of Montevideo."
Francisco Antonio Saavedra, Chile: "A classified scheme of literature, science, and art for a Chilean encyclopedia based upon a uniform system of professional knowledge."
Dario E. Salas, Chile: "Means for an improvement in the preparation of the primary-school teacher."
Luis A. Solis, Chile: "The determination of the center of gravity in the human body."
Rodolfo Valenzuela, Chile: "Is it desirable to establish the coeducational system of primary instruction in the centers of large population?"
Adriana Valdivia, Chile: "The normal school as a national institution."
Floriza Videla, Chile: "Agricultural education in the normal school."
German Wichhardt, Chile: "How the teaching of physics and chemistry in the primary schools may be made practical."
Roberto Zapata, Bolivia: "The elements of Wundt's experimental psychology."
Francisco Zapata Lillo, Chile: "The 'croquis' in the teaching of foreign languages, and slang (lenguaje argótico) in the teaching of foreign languages."
Hipólito Contreras, Chile: "The qualities that a language should possess in order to secure its international adoption, and the graphic stellar system in Esperanto."
Augusto Biaut, Chile: "Esperanto as a language possessing the qualities that should lead to its adoption as an auxiliary international tongue."
Jose Novoa Orellana, Chile: "A mechanical system for the teaching of Esperanto by means of movable disks."
Eduardo Fabres, Chile: "The necessity for the adoption of an international language as a means of world communication."
Alejandro Canas Pinochet, Chile: "A study of the Veliche tongue."
Antonio Vidal, Argentine Republic: "School hygiene and pedagogical psychophysiology in the Argentine Republic. The scientific phenomena in American society. Hygienic education; the national school and the sanitary crusade. Social and public hygiene; its progress in American countries; a proposition concerning its condition absolute and relative."

REPORT ON SUBSECTION 17—FINE ARTS, BY MR. W. H. HOLMES.

The papers presented to this section were as follows:

Marcial Martinez de Ferrari, Chile: "Study of the influence of the fine arts in our civilization."

S. Alberto Mackenna, Chile: "Influence of the fine arts in education."

R. Guillermo Eyzaguirre, Chile: "Distinctive characteristics of the literature of America as compared with that of Europe."

Jorge Huneeus, Chile: "Historical review of the intellectual effort of Chile."

Eduardo Poirier, Guatemala: "Science and letters in Guatemala."

Carlos Silva Vildosola, Chile: "The press of the American nations as the best means of cementing the bonds between them."

Moisés Montt, Chile: "Journalism in America."

Francisco Risopatrón, Chile: "Origin of the Spanish language and of its idioms and richness."

Adolfo Urzua Rozas, Chile: "Measures which tend to prevent the corruption of the Castilian tongue and which augment its richness in vocables used by educated people in America who speak that tongue."

Appendix O.

Report on Section IX. Agronomy and Zootechnics, by Mr. George M. Rommel.

The section on agronomy and zootechnics opened its session on Saturday, December 26, with an attendance of 32, including officers and visitors. Daily sessions were held, except on Sunday and New Year's Day.

The officers were Salvador Izquierdo, S., president; Julio Besnard, vice-president, and Jose A. Alfonso and R. Rojas Huneeus, secretaries. As was commonly done in other sections, various delegates were invited to preside over the different meetings. The affairs of the section were quite well conducted, the work of the active secretary, Señor R. Rojas Huneeus, being especially efficient.

The subject of agricultural education occupied the greater amount of time of the section, perhaps three-fourths of the discussion being on this topic. The enthusiasm was marked and the fact is important as showing the growing interest in the subject in Latin-American countries.

Señor Julio Besnard, of Chile, presented the first paper on agricultural education. He recommended that advanced agricultural education be given the character of university instruction.

Dr. Ricardo Huergo, chief of the division of education in the Argentine ministry of agriculture, followed with an elaborate presentation of a plan for agricultural education which contemplated the development of a complete system from the institute and extension systems common in North America to the full-fledged undergraduate course. His plan was divided into four parts: (1) Advanced agricultural education, (2) secondary agricultural education, (3) practical agricultural education, and (4) extension (extensiva) agricultural education. Doctor Huergo also strongly advised the obligatory study of English in all advanced agricultural schools.

A paper by Señor Ramon Montero (Uruguay) was read on "Agricultural instruction in the normal schools for teachers in Montevideo," in which the writer recommended that agricultural instruction be given in primary country schools, and even in schools in cities in agricultural districts, and that teachers should be trained in the normal schools so that they could give this instruction.

Señor Maximo Jeria (Chile) presented a paper on "Grades which may be established in agricultural education on the American Continent," in which he advised the division of this section of pedagogy into three grades: (1) Advanced, (2) secondary, and (3) primary. He pointed out that, in his opinion, advanced agricultural education should be designed for the training of men capable of conducting research work in the various branches of agricultural science; that secondary education should be for the training of skilled farmers, and the schools so designated should be more or less local in character; and that primary education should give boys and girls in the rural schools a practical idea of plant growth and of the best methods to use in simple farm and garden operations.

In all the discussions and papers on the subject it was made clear that agricultural educational institutions should be not only well equipped with laboratories for class use, but that they should be in close touch with agricultural experiment stations, and preferably should have farms attached to them of sufficient extent to carry on field investigations.

The conclusions and recommendations of this section show that an amalgamation of the different ideas presented was effected. It is very much to be regretted, however, that Doctor Huergo's recommendation in regard to the compulsory study of English in advanced schools was not favorably acted upon. In view of the importance of the North American agricultural experiment stations, both in the United States and Canada, and the probability of applying their results to a greater or less degree throughout the New World, students in Latin America would find a knowledge of English greatly to their advantage in pursuing research work in agriculture. Without such knowledge a very large amount of scientific information is not available to them.

The zootechnic branch of the section was represented by a relatively small number of papers, but this number included some very good ones. A paper by Drs. Heraclio Rivas and Cesar Zanelli, of the University of La Plata (Argentine Republic), was read, describing the poisoning of horses in the northern provinces of Argentina by the mycelium of a fungus found in *Festuca hieronyme*. The symptoms appear to be similar to those found in cases of poisoning of horses in the United States due to their eating hay containing the plant commonly known as the "horsetail" (Equisete). Affected horses show pronounced paralysis and gradually lose the power of locomotion. The affection is known in Argentina as "La Tembladera."

Dr. Ramon Bidart, of the division of animal industry of the Argentine ministry of agriculture, presented a detailed paper on tuberculosis, in which he presented a résumé of European work and gave complete data on the subject gathered by the Argentine Government. Doctor Bidart's conclusions were (1) that the American governments should combat bovine tuberculosis to increase the animal wealth and protect human health; (2) that measures designed to eradicate this disease in countries of large live-stock production should be carried out on liberal lines, the greatest efforts for eradication being directed toward herds from which food products, such as milk and beef, are derived; (3) that injections of tuberculin are not practicable of application to animals which are not stabled; and (4) that the presence of glandular affection of tuberculosis in one individual in the abattoir signifies nothing in itself with respect to the general condition of an entire herd of cattle, tuberculosis being a disease whose local affections are most frequently found in those organs.

On the subject of national sanitary police, Doctor Bidart recommended strongly the adoption of sanitary animal police laws in live-stock countries, and urged the necessity for the uniformity of such laws in neighboring countries. He also suggested the desirability of improving cattle within the areas infected with Texas fever cattle tick (*Boophilus annulatus*), such improvement having for its object the relief of cattle raisers in such areas from the necessity of going to uninfected areas for breeding stock.

Dr. Fernando Lahille (Argentine Republic) presented some interesting notes on the life history of the Texas fever cattle tick, on alpaca breeding and on fisheries. He urged the necessity for South American countries to pass laws for the protection of the alpaca and similar animals, and for the establishment of breeding stations where they could be studied and improved according to scientific principles. In regard to fisheries, Doctor Lahille recommended the establishment of laboratories in South American countries for the study of marine fauna, with the special object of encouraging the fishing industry, and suggested the desirability of adopting uniform laws throughout South America for its regulation. He also recommended that American naturalists confer regarding the nomenclature of fishes in the Western Hemisphere and methods of measuring and describing them.

The subject of veterinary education received attention from Dr. Clodomiro Griffin, dean of the faculty of agronomy and veterinary science in the University of La Plata (Argentine Republic), who presented a paper outlining an ideal course in veterinary science, and from Dr. P. Berges (Argentine Republic), who presented a resolution recommending that all American countries which have not already done so provide for such instruction.

On miscellaneous subjects some interesting suggestions were presented. Dr. Ricardo Huergo (Argentine Republic) discussed the advisability of "Extensive investigations to establish the relation existing between the absorbent power of soils and fertility as a basis for the determination of the latter." Señor R. Rojas Huneeus (Chile) urged the establishment of agricultural experiment stations in countries not yet having such institutions, and presented a detailed paper on the growth and development of such institutions throughout the world. Señor Rafael Uribe y Uribe (Colombia) and Maximo Jeria (Chile) urged the organization into ministries of agriculture of the work of the different American Governments which aim to foster and encourage agriculture. Señor Victorino Rojas Magallanes recommended the establishment of bureaus of agricultural statistics in the different countries, and made a suggestion that is of particular interest to citizens of the United States—that the Bureau of American Republics take steps to have translated into Spanish and distributed throughout Latin-America the Yearbook of the United States Department of Agriculture and such other reports or bulletins of the department as would be interesting to Latin-American farmers and stock raisers.

A short paper by Director F. H. Newell, of the United States Reclamation Service, was read on "The reclamation of arid lands in the United States." Mr. Newell showed concisely the steps through which the reclamation of arid lands has been developed, and presented the fundamental principles on which the work of the United States Government is based.

The recommendations adopted by the section were as follows:

Agricultural education, for its development, should be divided into three grades: Higher, secondary, and elementary-practical.

A. Higher agricultural education:

(1) The section of agronomy and zootechnics declares that it regards as indispensable that the American countries which have not already done so give to higher education in agriculture the character of university instruction.

To this end, a faculty of agronomy should be established with due provision that the institutions which give this instruction are supplied with the necessary laboratories and are located on property of their own, in which said instruction can be amply applied and demonstrated.

B. Secondary education:

The instruction of a secondary character should be theoretical and practical, and should be distinguished by its local character, confining especially the work done to the branches of agriculture peculiar to the region in which they are situated, and developing the teaching of them under a local management. The institutions which give this instruction should be established on farm properties of sufficient extent, conveniently located, and adapted to an economical developemnt so as to train agriculturists and specialists capable of directing work on a rural establishment.

C. Practical-elementary education.

The practical-elementary education should be local and made specific in certain branches of agronomic science best suited to local application, developing the work in detail and supplying the proper explanations as each act is performed, in all the operations which deal with the planting, development, and management of a farm property of the kind and importance which the school should have in mind.

D. In order to complete agricultural education, the American countries should keep in view—

(1) Supplementary establishments for agricultural and experimental development, such as agricultural experiment stations, laboratories of vegetable pathology and vitology, special stations, agricultural statistics, etc.

(2) With the development of extension teaching through the medium of demonstration farms, by the aid of local farmers, and, in general, by all the means of propaganda which enable agricultural instruction to reach the farmer himself so as to guide him in his work.

E. The secondary and practical-elementary agricultural instruction, as well as the different activities involved in official agricultural propaganda, should be organized systematically in accordance with the needs of the country, and should be placed in charge of the executive power, for the attainment of which purpose the Government should possess a central administrative mechanism, capable of regulating the system and controlling its results, a ministry of agriculture, with its dependencies, being the most efficacious of all.

F. In order to awaken and stimulate a desire for agricultural study, the section of agronomy and zootechnics believes—

(1) That the primary schools in the country, and even in cities in agricultural districts, should include compulsory agricultural education as an integral part of their course of study.

(2) That in the courses of study in normal schools, instruction in theoretical and applied agriculture should be included, in order to render teachers capable of giving such instruction in the primary schools.

The following is the list of papers presented in the section:

Alfonso, José A., Chile: "Forests and forest legislation."

Amadeo, Tomás, Argentine Republic: "Agricultural associations."

Bergés, P., Argentine Republic: 1. "The live-stock resources of Latin-America, especially Argentina." 2. "Importance of improving the different species of animals in the Argentine Republic; method of encouraging this in the Latin-American countries." 3. "Injurious effects of the neglect shown toward the improvement of cattle in Latin-America; means of remedying it." 4. "The need of encouraging in Latin-America the development and extension of the refrigerating industry and of refrigerator transportation for the advancement of various rural industries." 5. "The transformation of the meat trade of Latin-America into a systematic industry; its condition, present and future." 6. "Project for the establishment of a permanent committee of the Latin-American Congress."

Besnard, Julio, Chile: 1. "Instruction in zootechnics; general considerations and programmes." 2. "Preparation of students for advanced agricultural colleges; practical agricultural education." 3. "Encouragement of animal production."

Bidart, Dr. Ramon, Argentine Republic: 1. "Tuberculosis." 2. "Sanitary police laws."

Bretos, Laureano, Guatemala: "Zootechnic ideas."
Briano, Juan A., Argentine Republic: "An automatic cattle guard for railways."
Brümmer, J., Argentine Republic: "Desiccation of fruits and vegetables; evaporating ovens and apparatus."
Conti, Marcelo, Argentine Republic: "The mechanical theory of a new plow."
Vallejo, Carlos, Chile: 1. "The action of chlorides on the nitrates of the soil." 2. "Artificial pressure with various salts and their effect on the growth and fruiting of plants."
Darel, Dr. Desiderio, Argentine Republic: 1. "Economic importance of the alpaca and similar animals in Argentina." 2. "Ostrich breeding in the countries of America."
De Vinzac, V. Gase, Argentine Republic: "Agricultural bookkeeping."
Division de Agricultura of the Argentine Government: Work accomplished by this division in the year 1908.
Escobar, Rómulo, Mexico: "Agricultural education in Mexico."
Gamboa, Ezequiel, Argentine Republic: "Nominal accounts in agricultural bookkeeping."
Girola, Carlos, Argentine Republic: 1. "Cultivation of industrial plants in the Argentine Republic." 2. "Notes on Argentine fruit culture." 3. "The cultivation of the peach in the Argentine Republic." 4. "Degrees which may be established in agricultural education on the American continent."
Griffin, Clodomiro, Argentine Republic: "A plan of instruction in veterinary medicine."
Guarch, Susviela, Uruguay: 1. "The nutrition of animals." 2. "Industries in general and the live-stock industry in particular."
Henriquez, Carlos, Chile: "Sketch of the saltpeter propaganda in the Argentine Republic."
Huergo, J. N., Argentine Republic: "*Diaspis pentagona* in the Argentine Republic."
Huergo, Ricardo, Argentine Republic: 1. "Advanced agricultural education." 2. "Special agricultural education." 3. "Practical agricultural education." 4. "Extension agricultural education." 5. "The soil in agriculture."
Huneeus, F. Rojas, Chile: "Development of agricultural experiment stations in the principal countries and their influence on agricultural progress."
Jeria, Maximo, Chile: 1. "Degrees which may be established in agricultural education on the American continent." 2. "Economic characteristics of the agricultural industry compared with the textile and manufacturing industries." 3. "The encouragement of agriculture."
Lahille, Fernando, Argentine Republic: 1. "Fecundity of the Texas fever cattle tick: An account of some important periods of its life." 2. "Breeding the alpaca." 3. "Observations concerning fishes and fisheries."
Le Feunre, Rene, Chile: "Motion on the study of Anthropotechnics (Eugenics)."
Magallanes, Victorino Rojas, Chile: "Chilean legislation on agricultural statistics."
Medina, Guillermo, Chile: "A new system of farming adapted to arid lands, the methods of Salvador Izquierdo, S."
Montero, Alfredo Ramon, Uruguay: 1. "Necessity for preserving and increasing the forests in American countries." 2. "Agricultural instruction in the normal schools in Montevideo."
Newell, F. H., United States: "The reclaiming of arid lands in the United States."
Renom, George A., Argentine Republic: "Feeding live stock for export."
Rivas, Heraclio, and Zanelli, Cesar, Argentine Republic: "La Tembladera, a disease of horses in the northern provinces of the Argentine Republic."
Rommel, George M., United States: 1. "Methods of instruction in animal husbandry in the agricultural colleges of the United States." 2. "Sanitary animal police in the United States."
Tonnelier, Argentine Republic: "Contribution to the study of means to combat rust in wheat."
Torreggioni, José, Bolivia: "Sanitary veterinary police laws."
Uribe y Uribe, Rafael, Colombia: 1. "Monograph on the banana." 2. "Cultivation of Hawa rubber." 3. "Necessity for departments of agriculture in America."
Vidella, Florisa, Chile: "Agricultural instruction in normal schools."

Appendix P.

Names of the Members.

OFFICIAL DELEGATION OF THE UNITED STATES.

Chairman: Dr. L. S. Rowe, University of Pennsylvania.
Vice-chairman: Dr. Paul S. Reinsch, University of Wisconsin.
Dr. Hiram Bingham, Yale University.
Dr. Archibald Cary Coolidge, Harvard University.
Col. W. C. Gorgas, U. S. Army.
Mr. W. H. Holmes, Smithsonian Institution.
Dr. Bernard Moses, University of California.
Mr. George M. Rommel, Department of Agriculture.
Dr. W. R. Shepherd, Columbia University.
Dr. W. B. Smith, Tulane University.
Secretary: Mr. Clarence L. Hay.
Assistant secretary: Mr. Charles G. Neumann.
Second assistant secretary: Mr. Huntington Smith.

DELEGATES OF THE ASSOCIATION OF AMERICAN UNIVERSITIES.

University of California, Dr. Bernard Moses.
University of Chicago, Dr. A. A. Michelson, Dr. J. L. Laughlin.
Columbia University, Dr. W. R. Shepherd.
Cornell University, Mr. Orville Adelbert Derby.
Harvard University, Dr. Thomas Barbour, Dr. Archibald Cary Coolidge, Dr. J. B. Woodworth.
University of Illinois, Mr. A. Hempel.
University of Michigan, Dr. H. D. Curtis.
University of Minnesota, Dr. C. W. Hall.
University of Pennsylvania, Dr. L. S. Rowe.
Princeton University, Dr. W. E. Browning.
University of Wisconsin, Dr. Paul S. Reinsch.
Yale University, Dr. Hiram Bingham.

DELEGATES OF AMERICAN UNIVERSITIES.

University of California, Dr. Bernard Moses.
University of Chicago, Dr. A. A. Michelson, Dr. J. L. Laughlin.
Columbia University, Dr. W. R. Shepherd.
Cornell University, Mr. Orville Adelbert Derby.
George Washington University, Mr. W. H. Holmes.
Harvard University, Dr. Thomas Barbour, Dr. Archibald Cary Coolidge, Dr. J. B. Woodworth.
University of Illinois, Mr. Adolph Hempel.
University of Michigan, Dr. H. D. Curtis.
University of Minnesota, Dr. C. W. Hall.
Northwestern University, Dr. W. F. Rice.
University of Pennsylvania, Dr. L. S. Rowe.
Princeton University, Dr. W. E. Browning.
Tulane University, Dr. W. B. Smith.
University of Wisconsin, Dr. Paul S. Reinsch.
Yale University, Dr. Hiram Bingham.

DELEGATES OF OTHER INSTITUTIONS.

Dr. L. S. Rowe, American Academy of Political and Social Science.
Mr. D. E. Salas, National Education Association of the United States.

Appendix Q.

Personnel of Organization Committee and Regulations of the Pan-American Scientific Congress.

COMMITTEE ON ORGANIZATION.

Marcial Martinez, honorary president; Valentin Letelier, president; vice-presidents Manuel Eigidio Ballesteros and Miguel Cruchaga; Eduardo Poirier, general secretary; Octavio Maira, treasurer.

Members: Alejandro Alvarez, Luis Espejo Varas, José Ramon Gutierrez, Anselmo Hevia Riquelme, Vicente Izquierdo, Alejandro del Rio, Domingo V. Santa Maria, Miguel Varas.

Augusto Vicuna S., assistant secretary.

REGULATIONS OF THE FIRST PAN-AMERICAN SCIENTIFIC CONGRESS.

Article 1. In accordance with the resolutions of the Third Latin-American Scientific Congress of Rio de Janeiro, a Fourth Scientific Congress (First Pan-American) will meet in the city of Santiago, in the month of December, 1908, under the auspices of the Government of Chile.

The congress will open on the 25th of said month of December, and adjourn on the 5th of January, 1909.

Art. 2. The work of organization and procedure of the fourth congress shall be in charge of an executive committee composed: First, of members appointed by the third congress at the full session held on August 16, 1905; second, of members elected by the said committee.

Art. 3. The executive committee shall elect the officers of the congress, composed of a president, two vice-presidents, a general secretary, one or two assistant secretaries, a treasurer, and an assistant treasurer.

There shall also be interpreters, clerks for the secretary's office, and such other employees as may be deemed necessary.

Said committee shall appoint such honorary presidents as it may deem advisable.

Art. 4. The executive committee shall be subdivided into subcommittees, each of which shall be composed of a chairman and two members selected by said executive committee.

Art. 5. The duties of the executive committee are:

1. To arrange for the fourth congress and to represent it with the Chilean Government, the universities, and other scientific, national, and foreign corporations.

2. To appoint, at the capitals of the American States, committees whose duties shall be to cooperate in the holding of the congress, to prepare the list of the persons to be invited to participate in its proceedings, to procure an adequate representation from the several countries, and to suggest questions as, because of their evident American interest, should be submitted to the congress.

3. To authorize disbursements and to approve accounts before being presented to the proper accounting authority.

4. To prepare the final questions to be propounded in accordance with the reports presented by the subcommittees.

5. To prepare a list of names of the members of the congress, in conformity with the provisions of article 10.

6. To appoint such spokesmen as may be necessary to set forth before the proper sections the status of the question on such official topics as the executive board may consider of special interest.

Art. 6. After the election of the officers of the congress the aforesaid committee shall cease to exercise its functions, but shall reassume them upon the adjournment of the congress. It shall then have charge of the publication of such papers as may have been submitted, and shall sufficiently authorize the members of such new committee as may be appointed to arrange for the Fifth Scientific American Congress.

ART. 7. The subcommittees referred to in article 4 shall correspond to an equal number of sections of the congress, and shall be the following:

1. On pure and applied mathematics.
2. On physical sciences.
3. On natural, anthropological, and ethnological sciences.
4. On engineering.
5. On medical science and hygiene.
6. On juridical science.
7. On social sciences.
8. On the sciences of pedagogy and of philosophy.
9. On agronomy and zootechnics.

Each subcommittee may be subdivided into two or more committees when deemed necessary, and two or more subcommittees may become a single committee.

ART. 8. It shall be the duty of each subcommittee—

1. To prepare a list of the questions to be propounded to the proper section.
2. To prepare a list of the members of the same.
3. To receive and classify such statements, studies, and communications as are sent to the section, and to designate the reporting member thereof, who shall inform the Congress of the views of the committee concerning the conclusions adopted by it.
4. To see that a report is made of the papers sent the committee, and which papers are not to be read by their authors.
5. To organize the proper section.
6. To receive the papers from the proper section and prepare them for publication.

ART. 9. A preliminary session of the congress shall be held within three days of its formal opening, in order to approve rules and regulations for the congress and to select the final officers thereof.

The officers of the executive committee shall preside at these preliminary meetings.

ART. 10. The following persons shall be regarded as members of the congress:

1. The official delegates of the countries represented.
2. The delegates of the universities, institutes, societies, and scientific centers of the countries represented as well as of other countries of America.
3. Such persons as attend the congress invited by the executive committee, on motion, or at the request of the proper subcommittees or of the committees of the different countries.
4. The supporters of the congress who contribute with the quota of £1 sterling, and who are accepted by the executive committee.

ART. 11. All the members of the congress shall be entitled to attend its sessions, to take part in the debates, and to receive a copy of such publications as the executive committee may issue.

ART. 12. Before the proper membership card is issued the payment of the quota referred to in paragraph 4 of article 10 shall be made to the treasurer of the executive committee, after the proper advice of the general secretary or of the respective subcommittees.

ART. 13. Of the full sessions held by the Congress, the opening and the closing sessions shall be formal ones.

The subcommittees shall hold separately such meetings as they may deem necessary for the discussion of the matters submitted to them.

ART. 14. Such Americans as have become prominent in the field of science may be appointed honorary members of the fourth congress whenever the executive committee deem proper to confer this honor upon them.

ART. 15. Papers for the congress shall be received as late as September 30, 1908.

Authors of papers not forwarding the same in due time should forward the titles thereof to the general secretary within the time specified.

ART. 16. Each subcommittee shall designate at the proper time the places, institutions, or special establishments to be visited by the members of the congress, and shall indicate how these visits are to be made.

THE EXECUTIVE COMMITTEE.

Appendix R.

Local Committees of the Pan-American Scientific Congress.

COOPERATIVE COMMITTEES IN THE AMERICAN REPUBLICS.

Argentine Republic.—Buenos Aires: Dr. Eduardo Aguirre, Dr. Juan B. Ambroseti, Dr. Enrique del Arca, Dr. Gregorio Araoz Alfaro, Dr. Marco M. Avollaneda, Dr. Rafael Calzada, Dr. Eliseo Canton, Adolfo P. Carranza, Dr. Alberto Castano, Dr. Emilio R. Coni, Dr. Adolfo Davila, Dra. Petrona Eyle, Ventura Fraga, Dr. Joaquin V. Gonzalez, Dra. Cecilia Grierson, Dr. Luis A. Huergo, Dr. Jose Ingegnieros, Dr. Samuel Lafone Quevedo, Dr. Manuel Lainez, Dr. Benjamin B. Martinez, Dr. Jose Nicolas Matienzo, Emilio Mitre, Dr. Francisco P. Moreno, Dr. Calixto Oyuela, Dr. Ernesto Quesada, Dr. Rodolfo Rivarola, Dr. Jenaro Sisto, Alberto del Solar, Dr. Eduardo Talero, Dr. Eufumio Uballes, Dr. Mariano Vedia, Dr. Carlos Voga Belgrano, Dr. Roberto Wernicke. La Plata: Juan Vucetich.

Bolivia.—La Paz: Dr. Natalio Aramayo, Fray Nicolas Armentia, Obispo de la Paz, Dr. Alfredo Ascarrunz, Dr. Moisos Ascarrunz, Dr. Manuel Vicente Ballivian, Leonidas Banderas Le Brun, Dr. Jose M. Camacho, Anival Caprilos, Dr. Jose Carrasco, Daniel del Castillo, Belisario Diaz Romero, Dr. Jose Maria Eyzaguirre, Dr. Eduardo Idiaquez, Dr. Francisco Iraizos, Dr. Arturo Loayza, Dr. Manuel B. Mariaca, Dr. Andres S. Munoz, Dr. Claudio Pinilla, Dr. Macario Pinilla, Dr. Jose S. Quinteros, Dr. Bautista Saavedra, Dr. Elias Sagarnaga, Dr. Luis Sainz, Dr. Daniel Sanchez Bustamente, Dr. Claudio San Jines T., Dr. Juan M. Saracho, Dr. Rosendo Villalobos, Dr. Jose G. Villanueva. Sucre: Dr. Valentin Abocia.

Brazil.—Rio de Janeiro: Modeiros e. Albuquerque, Candido Mendes de Almeida, Machado de Assis, Dr. J. C. de Souza Bandeira, Dr. Clovis Bevilacqua, Olavo Bilac, Dr. Joaquin de Oliveira Botelho, Dra. Myrthes Gomes de Campos, Dr. Adherbal de Carvalho, Dr. Affonso Celso, Dr. Gaston da Cunha, Dr. Zeferino de Faria, Dr. Carlos Soares Guimaraens, Dr. Humberto Gotuzzo, Dr. Juan B. de Lacerda, Dr. Solidonio Leite, Dr. Fernando Magalhaes, Dr. Joao Marques, Joao F. de Lima Mindello, Dr. Joaquin Murtinho, Marques de Paranagua, Dr. Antonio Ferreira de Souza Pitanga, Jose Francisco da Rocha Pombo, Joaquin Cardozo de Mello Reis, J. Barboza Rodrigues, J. Americo dos Santos, Dr. Deodato C. Vilella dos Santos, Coronel Ernesto Senna, Commendador Joaquin Cunha da Silva, Manoel Cicero Pelegrino da Silva, Simoens da Silva, Dr. A. A. de Azevedo Sodre, Goffredo de Escragnolles Taunay, Jose Verissimo, Dr. Manoel Alvaro de Souza Sa Vianna. Bello Horizonte: Dr. Nelson de Senna. Campinas: Dr. Cesar Bierrenbach, Souza Brito, Andrade Duarte, Tito de Lemos, Alvaro Miller, Campos Novaes. Sao Paulo: Dr. Carlos Botelho, Dr. Leopoldo de Freitas, Dr. Ferreira Ramos.

Colombia.—Dr. Luis Felipe Calderon, Dr. Miguel Antonio Caro, Rafael M. Carrasquilla, G. Ceron Camargo, Rufino Jose Cuervo, Ruperto Ferreira, Julio Garavito, Dr. Adolfo Leon Gomez, Antonio Jose Iregui, Dr. Juan E. Manrique, Dr. Vicente Olarte Camacho, Dr. Eduardo Posada, Carlos E. Pudnam, Dr. J. M. Rivas Groot, Rafael Rocha Gutierrez, Baldomero Sarrio Cano, Marco Fidel Soarez, Rafael Tamayo, Dr. Antonio Jose Uribe, Santiago Uribe, Numael Vasquez, Francisco Vergara Velasco, Dr. Liborio Zerda.

Costa Rica.—Dr. Luis Anderson, Roberto Brenes Mesen, Justo A. Facio, Dr. Ricardo Gonzalez Guardia, Elias Leiva, Miguel Obregon, Dr. Elias Rojas, Rafael Angel Troyo, Dr. Antonio Zambrana.

Cuba.—Osvaldo Bazil, Armando de Cordova, Dr. Ricardo Dolz y Arango, Ramiro Hernandez Portela, Julio Jover, Manuel Landa, Manuel S. Pichardo, Nicolas Rivero, Federico Uhrbach, Aniceto Valdivia.

Dominican Republic.—Rafael Abreu Licairac, Dr. Tulio M. Costero, Fabio Fiallo, Dr. Enrique Henriquez, Dr. Federico Henriquez y Carvajal, Dr. Americo Lugo, Pedro Marin, Gen. Casimiro N. de Moya, Dr. Apolinar Tejera, Dr. Emiliano Tejera.

Ecuador.—Quito: Dr. Luis Felipe Borja, Dr. Manuel M. Casares, Roberto Espinosa, Arzobispo Federico Gonzalez Suarez, Victor M. Penaherrera, Gualberto Perez, Miguel Valverde. Guayaquil: Alfredo Baquerizo M., Dr. Cesar Borja, Francisco Campos, Manuel A. Campos, Dr. Carlos Carbo Viteri, Dr. Julian Coronel, Ramon Flores Onta-

neda, Juan Illingworth. Ambato: Augusto N. Martinez. Cuenca: Dr. Rafael M. Arizaga, Dr. Luis Cordoro, Dr. Remijio Crespo Toral.

Guatemala.—Dr. Francisco Anguiano, Dr. Antonio Batres Jauregui, Iltmo. Arzobispo Ricardo Casanova y Estrada, Lic. Francisco Contreras B., Lic. Ricardo Contreras B., Felipe Estrada Paniagua, Dr. Augustin Gomez Carrillo, Lic. Joaquin Mendez, Dr. Juan J. Ortega, Dr. Salvador Ortega, Jose Joaquin Palma, Dr. Ramon A. Salazar, Maximo Soto Hall, Lic. Emilio Ubico, Dr. Manuel Valle.

Haiti.—Dr. M. Domond, M. Georges Sylvain, Dr. M. Jeanty, M. Lamartinier Denis, M. Murville Ferere, H. Pauleus Sannon.

Honduras.—Dr. Manuel Francisco Barahona, Dr. Policarpo Bonilla, Dr. Jeremias Cisneros, Dr. Emilio Carrera, Valentin Duron, E. Constantino Fiallos, Lic. Esteban Guardiola.

Mexico.—Augustin Aragon, Manuel Fernandez Leal, Dr. Miguel Macedo, Dr. Pablo Macedo, Dr. Gregorio Mendizabal, Dr. Jesus E. Monjaras, Juan de Dios Peza, Dr. Emilio Pimentol, Justo Sierra, Jesus E. Valenzuela, Manual Zapata Vera.

Nicaragua.—Managua: Santiago Arguello, Jose Dolores Gamez, I. Matamoros J., Dr. Manuel C. Matus. Leon: Gustavo Guzman. Granada: Carlos Selva.

Panama.—Dr. Tomas Arias, Dr. Julio Arjona, Dr. Pablo Arosemena, Federico Boyd, H. Lupi, Dr. Belisario Porras, Dr. Luis de Reux.

Paraguay.—Danial Anisits, Dr. Cecilio Baez, Jose S. Decoud, Dr. Manuel Dominguez, Dr. Justo P. Duarte, Manuel Gondra, Dr. Teodosio Gonzalez, Jose Jimeno, Dr. Manuel P. Montero, Juan E. O'Leary, Ignacio Pane, Dr. Hermenejildo Roa, Dr. Guillermo Stewart, Dr. Juan Vallory.

Peru.—Dr. Francisco Almenara Butler, Dr. S. Barranca, Almirante Meliton Carvajal, Dr. Salvador Cavero, Eulojio Delgado, Dr. Alberto Elmore, Dr. Ednardo Havich, Dr. Jose Augusto de Izcue, Coronel Ernesto Lacombe, Dr. David Matto, Ricardo Palma, Dr. Pablo Patron, Pedro E. Paulet, Dr. Manuel O. Tamayo, Dr. Uhle, Federico Villarreal.

Salvador.—Dr. Nicolas Aguilar, Santiago I. Barberena, Dr. Gustavo S. Baron, Dr. Carlos F. Dardano, David J. Guzman, Dr. Jose Pena Fernandez, Miguel Pinto, Calixto Velado.

United States.—Prof. Leo S. Rowe, University of Pennsylvania; Prof. William R. Shepherd, Columbia University; Universities of California, Chicago, Columbia, Cornell, George Washington, Harvard, Illinois, Johns Hopkins, Michigan, Minnesota, Pennsylvania, Princeton, Texas, Wisconsin, and Yale.

Uruguay.—Dr. Eduardo Acevedo, Dr. Matias Alonso Criado, Orestes Araujo, Prof. Jose Arrechavaleta, Dr. Carlos Berro, Dr. Ernesto Fernandez Espiro, Dr. Pedro Figari, Dr. Daniel Garcia Acevedo, Da Alfredo Giribaldi, Dra. Paulina Luisi, Carlos M. Maeso, Juan Monteverde, Luis Morandi, Dr. Jaime H. Oliver, Dr. Manuel B. Otero, Dr. Carlos M. de Pena, Dr. Luis Pineiro del Campo, Alfredo Ramos Montero, Jose Enrique Rodo, Dr. Joaquin de Salterain, Dr. Augusto Turenne, Pablo Varzi, Dr. Alfredo Vidal y Fuentes, Damian Vivas Cerantes, Dr. Juan Zorrilla de San Martin.

Venezuela.—Ramon E. Albarracin, Cesar Baldo, Eduardo Blanco, Eduardo Calcano, Dr. Juan Manuel Hurtado Machado, Dr. Simon Planas Suarez, Gumersindo Rivas, Pedro Manuel Ruiz, Dr. Marco Antonio Saluzzo, Dr. Elias Toro, M. Tosta Garcia, Nerio A. Valarino.

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